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CHARLES A. BENNETT

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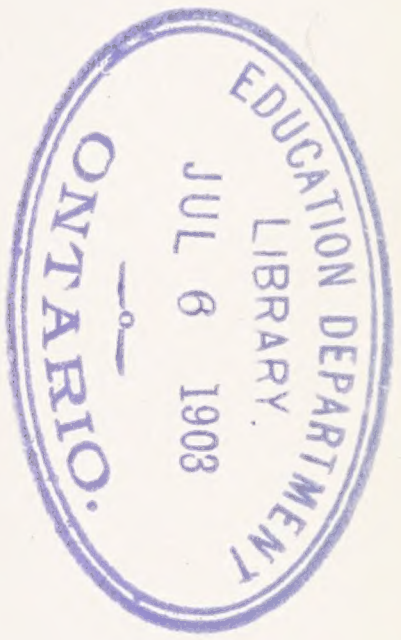

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JOHN D. RUNKLE.

VOLUME IV NUMBER 1

MANUAL TRAINING MAGAZINE

OCTOBER, 1902

POSSIBILITIES OF ART EDUCATION IN RELATION TO MANUAL TRAINING.[1]

ERNEST E. FENOLLOSA,
Mobile, Ala.

I NATURALLY approach this complex subject from the point of view of art, because my experience for twenty-five years has fallen chiefly in that direction. My knowledge of recent methods in manual training was so meager, and I felt so little able to put before myself the immediate problem of the grade-school teacher, that I shrank from accepting the invitation to read this paper. Professor Richards, however, overpersuaded me, on the ground that, in taking a larger view, based upon the art and social experience of several races and of many times, I might be able to contribute some suggestions of value.

In the first place, I find it extremely difficult to conceive a clear line of division between manual training and art education. The two are not merely entangled, but identical. We cannot draw the line, as the word "manual" seems to imply, at handwork, for all forms of visual art demand the highest muscular skill. Neither can a difference in use justify the cleavage, as if industry produced utensils to be consumed, but art luxuries to be treasured. Our modern collections in art museums have deceived us here—so many thousands of pictures and statues torn away from the places and uses which once gave them value!

Shall we, then, fall back on difference of plan, shopwork dealing only with laws of mechanical structure, art with spiritual? There, if anywhere, the line would cut. But such a limitation implies too much modesty and abnegation on the side of manual training. It defeats

[1] Delivered at the joint session of the Art and Manual Training Departments, National Educational Association, Minneapolis, July 10, 1902.

the specific end of a rounding out and synthesis of human faculties. It was a good thought to supplement book-work with handwork, and thus get away from abstractions. But if we confine the plan of work to mathematical and physical laws, we get right back to abstractions, in somewhat the same way as the old art teaching which harped upon type solids.

But the weakness of separation shows up more glaring still from the side of art. Painting and sculpture are but branches of useful industry, ways of treating material surfaces, the plaster and the bronze of architecture. Art infuses harmony into all man's surroundings, transfigures with some new law of his spirit the material which he touches, makes virtual extension of the realm where internal affinities supplement external restraints. Beauty exhibits a kind of higher economics, in which waste and even compromise must be eliminated, in that each part helps all and uses all. A thing, therefore, can have no real beauty if its material values be not involved in the harmony.

Hence I urge the union of art education and manual training on higher grounds than the clamor of industry for superficial ornament; I declare it to be involved in the very life and health of art education itself. As a student of the history of art, I assert that the great creative impulses of all races and times have sprung from the needs and laws of structure. Not only is this clear in the simplicity and structural quality of all Greek ornament, but it is involved in the fact that the greatest schools of painting itself have grown out of mural painting. There boundary of column and arch and structural spacing furnish the very key to composition; the lighting of the wall strikes the note of the necessary values; and the colors of surrounding materials govern the pictorial tones. The so-called easel picture that starts from blank canvas, with no trace of structural key, has seldom furnished seed for a great school of art. It gluts the market, as we see in our exhibitions, with unusable objects, fit only for the mausoleums of art galleries. But the vitality of Greek mosaics, of Italian frescoes, of Chinese and Japanese mediæval painting, springs solely from the fact that structural problems furnished the seed for the æsthetic. So with sculpture. Greek statues, torn from their appropriate niches, crowded into the palaces of Roman conquerors, eventually dug out of the ruins of those palaces and set up artificially in Italian gardens, have at last come to litter the corridors of our museums, thus becoming virtually threefold abstractions. And the worst of it is that we go on creating more abstract Venuses to crowd more corridors!

Why has this fatal gap between art and structure been allowed to vitiate the work of our schools? My answer is, because the nature and aim of art have been falsely conceived to be representation. In all discussions about art in schools I see talk of landscapes and dramatic groups, of technical advance in shadow-drawing, perspective, anatomy, and of the separate study of noses and toes. Art, we suppose, is the painting of things, and, therefore, if we let children sit down and express their crude ideas, it will be the natural beginning of art education. Somehow or other we seem surprised when we find that children of the middle grades have learned practically nothing from all this, and are quite incapable of any systematic progress. But there need be no surprise. Leading artists whom I have talked with, in New York and elsewhere, generally condemn this realistic art work in schools as waste of time. No child, say they, under the age of fifteen or sixteen can master the scientific analysis necessary to represent with accuracy. And this opinion seems to be borne out by the experience of our teachers. There is no progressive way to teach these abstract means to the child mind.

But even if this elementary work in representation were practical, it had absolutely nothing of help to offer the manual trainer. He, weighted with the inertia of matter, asked for a hint of grace to enliven his mechanics, and all he could get in reply was how children tell a story. Perspective and anatomy and cast shadows and reflected lights are useless to him. Of themselves they imply no harmony, no proportion, no graceful adjustment, no interior law.

And here we come flat against the great antinomy of modern art: the dualism—nay, the *divorce*—between representation and design. Before the year 1600 no such gap existed. In no creative era have painters suspected that their work differed from industry. It was only after pride in the mastery of realism led to the conception of painting as an intellectual and academic exercise superior to craft, that design fell into contempt. We now admit that industrial ornament may be conventional; but in order to prevent its poisoning our academic courses, we shut it up in water-tight compartments labeled "design schools." In 1887 I visited the South Kensington Museum and Academy, which had been founded by the English government for the very purpose of building up national design. But the director confessed to me that the purpose was practically defeated in that all the best pupils insisted on taking the painting and sculpture courses, leaving only the incapables for the inferior work.

And that this ingrained prejudice against design lingers with us today is proved by the enormous disproportion between demand and supply in art. Here we have tens of thousands of abstract paintings and sculptures dumped upon the world year after year, with no purchasers ; while, on the other hand, our manufacturers in vain offer large prizes for corps of designers, who have to be supplied chiefly from Belgium and France. We see it in the fact that we still assume proper art work in schools to be based upon representation. We see it in the persistent use of the word "conventional" which, in the very arguing away from representation, still takes representation for the starting-point. We see it in the preference of the superficial term "decorative" to the vital term "structural."

But this antinomy, this divorce of representation from structure, is a mistake. It is not that one approaches nature and the other recedes from it ; it is that under both lies a common set of vital qualities which define their value of art. These are the qualities of unity, of harmony, of affinity, between line and line, mass and mass, color and color. These comprise a whole new world for study, as truly as do the laws of harmony in music. This is what distinguishes art from not-art. If a design has those visual harmonies, it is good. If a representation has them, it is good. If it has them not, it is bad as art, no matter how good it may be as representation.

I am not the least surprised to find that the representative art work of children does not improve, rather degenerates, above the first and second grades. What else could we expect? If it could improve, it would only be because conscious mastery of these underlying harmonies was taught. But it is not taught. The seed of art is not nature, but the consciousness of harmony in the mind, which goes out from itself to see beauty in nature. The country bumpkin finds nothing in the sunset that nightly would minister to him. But the child whose keen grasp of harmony has been stimulated, not blunted, recognizes all beauty in a common leaf. Therefore art education can be nothing but the orderly stimulation by exercise of this power to perceive and create beauty.

Now, the best and most natural exercise of this faculty is found in beautifying the products of human industry. It is a mere accident of habit that we should study line harmonies in the form of pencil marks on paper. These are abstractions from reality. Better to find them in the lines of support and stress, the patterns of weaving, and the yielding contours of pottery. Here they are realities, and here the child

feels their identity with human needs and human history. Let us create in matter, not merely on paper.

One of the most vital thoughts of manual training has been to follow the course of evolution in leading human industries. Here the structural need spells itself out to the child, as to the primitive man. But how if the æsthetic need, the order of the synthetic line and color problems, were found to follow essentially the same course? The simplest line relations should spring naturally from the simplest industries. The savage hut would grow into the Greek temple by a progressive refining of lines which were always structural. The study of dark and light would follow, not the difficult representation of shadows in drawing, but the way in which the indentations and openings of structure contribute to the beauty of things. We need not be forced here to press history too far. Still it remains true that all the artistic possibilities of line problems lie wrapped up in the indications of the loom, the forge, the potter's wheel, the contrast of supporting posts with horizontal lintels, in the strengthening transition of the diagonal bracket, and in the supreme synthesis of the arch.

If this be true, it will not be difficult to state an important practical law in all art work. This is that all line and color systems should utilize, spring from, carry out, enrich, but never obscure, the structural elements given in the uses, forms, and materials of things. This rule is as absolute in the highest realms of painting and architecture as in the lowest of basket-weaving. It distinguishes strong art from weak everywhere. It is a rule which manual training is in natural position to apply for itself.

Let us follow this matter a bit farther. Art consists in the positive value given to each other by a group of contiguous visual areas. One of the simplest kinds of such value is given in the proportion of these areas. In fact, a feeling for fine proportion is one of the natural instincts of the human race. But all industrial structures present contiguous areas — for instance, the sides of a piece of furniture, the spacings of roof, wall, and story in buildings. Here the use and the structure furnish a plan or key which the art instinct is asked to refine, not obscure. The beauty must be made to lie in these main spacings. But we violate this law everywhere in the crude notion of applying ornament. Wherever we see an empty space we rush to mar it by filling it with trivialities. All inlay, all shadow mottling, all colors, which violate the large proportion of these spaces, are vicious. The most complex figure-painting, if it be good, carefully divides a few main areas.

The next step is to perceive that these areas, to be clear, must be bounded; hence the presence of line in all art. But the lines of things are structural, where planes intersect, or stresses converge. Curves are the expression of resistances. You can feel them in your thumb. Now, art takes up these lines and refines them to a single, clear impression. It does not impose something alien upon them. It expands them into fuller meaning. They still underlie and guide its most complex system.

How opposed to almost all our ordinary methods of drawing and designing is this rule! We sprawl our lines lawlessly anywhere over our paper or wood, making arbitrary curves and systems which only deface our surfaces. Let all lines spring from the main lines. How splendidly painting follows this rule in the composition of Raphael's Vatican stanze, and sculpture in the infinitely complex draperies of the Parthenon pediments! Structure forms the backbone of such ultimate line systems. But the law may be first exemplified in pottery.

Next we may see that our visual areas can be harmonized, not only in terms of their proportions, but in terms of their varying luminosities, the quantities of light which they severally reflect. It is not that dark and light spots are to be sprinkled about at will; but the law is that this dark and light must follow the dark and light of structure, and yet be beautiful. Any artificial inking or modeling which breaks the silvery luminosity of the planes is vicious. Materials, too, may give us these masses, as when bronze comes out dark against white marble.

More constantly than any other we violate this law. All poor drawing and painting relies upon the accidents of vagueness. We muddy our tones instead of keeping them flat and clear. But the best photography from nature often gives us composition in three clear values. This is why methods of stencil work and block printing, too, are so valuable in elementary study, that they secure flat tones and give scope for easy variation. Power to create in two or three tones underlies all the complex combinations of painting. The whole subject can be worked out in the course of rug-designing.

For three-dimensional study wood-carving has points of advantage over clay-modeling. It gives firmer lines and planes. In clay we smear weak, curved surfaces. In bad drawing we try to make things look round. But the great problem in art is not to make things look round, but how to make round things look square. We must conceive of solid things in planes. It is hard, in clay, to produce the impression

of firm planes. Both in our bad modeling and bad drawing we treat nature as if made up of tufts of wool or cannon balls.

So lead pencil is the worst possible tool to draw dark and light masses with. Pencil blacks have no flatness and no luminosity. They give tones like the grizzled head of a negro.

Lastly comes the grouping of visual areas according to the *quality* of the light with which they are charged. Here structure finds play chiefly through materials. The color scheme of a room is guided by the wood of its furniture, exterior house tints by the nature of landscape surroundings. But the color must not violate the purity of the large planes — thus distracting attention from the structure. Moreover, it should be simple. To let children run wild with a color-box is almost as criminal as to let them play with gunpowder. Yet, the three-color box is too limited. In the real art of color there are no primaries. Any groups that neutralize, out of thousands, may be taken as primary in their own key. Therefore we must constantly vary the tints we use, in order to advance in power over color. Perhaps one good method is sometimes to follow the evolution of pigments in industry. Color is a wonderful, great world of law, which has hardly yet been explored. It is a mistake to give it to children freely, just because they want it. The color sense is the latest and least developed in the human race of all the art instincts. To make it take the place of simpler and clearer work is to violate the order of nature and of evolution. Young children are interested more vitally in actions, and color lends least of all to the expression of action. The child's liking for color is, therefore, mostly aimless play.

I come, lastly, to what I conceive to be one of the highest merits in this view of art, namely, its identity of plan with physical and social life.

Such discipline in synthesis should have the highest spiritual value. The enthusiasm for fine proportion which becomes a second nature should transfigure our whole life. Every case of art is an enhancing of mutual values through contact. A color, like a man, becomes utterly transformed through its surroundings. The circle of the parts must be complete ; all are essential. Art so conceived gives us the type of positive economy, where each member is used to the full. It admits no loss, no waste, no clashing, no friction. It is literally transposed, for all the parts are reflected through each other. Such ease and perfection are found in normal animal life — the delicate feline curve, the sturdy tower of the pine. So the impulse in man to feel beauty and

to create it should be one. There is positive muscular delight in drawing a fine curve. So good carriage, graceful manner, genuine greeting, are the incorporation of this order in ourselves — a true species of art. Even character takes on an unconscious charm, as if its beauty were rather of a flower than of a gnarled oak.

The social value of such art education would be twofold. Its identity with the manual or industrial side brings personal work into conscious harmony with the great currents of civilization. Art, however individual in its creation, is no selfish loiterer in a detached heaven, as some sneeringly suppose. There can be but one Shakespeare and one Beethoven ; yet they have widened the very definition of humanity. So the pupil may feel that in his contribution, however humble, if it be genuine, he adds a new unit, a new art individual, to the sum of human treasure. And this treasure is to be no mere luxury for the galleries of the rich, but shall illumine the daily toil and consumption of the masses. In Japan today thousands of new designs, simple and fine, are turned out in cheap printed cottons for simple clothing, every year and every month. The national consciousness fairly bubbles with creative energy. Art is primarily social.

But a second and more subtle social value is given in the very type of being which such art embodies. It brings virtually a new dispensation, the age of harmony. A mechanical world carries us out and off into endless series of time, space, and cause. A utilitarian opens up endless lines of means. But all imply simple process, change ; there is no mutuality, no integration, no return into the self. So the world of scholastic logic which shuts over the European brain a cap of Chinese formalism can do nothing but run up and down endless scales of classification. Classification always accentuates an abstraction, a point of transition, as if our bamboo should be nothing but joints. When I pluck a flower or cut a seed to study it, I tear into death the very life I wish to observe. Definition is innocent of the element of reciprocity. Nothing really acts singly ; give becomes take ; all negation is reaction, as positive a process as action.

Now, if there were a kind of being in which mutuality reigned supreme, and all modifications became simultaneous, so that we must see all to know each one, this would give us a higher logical type, fitly to be called *harmony*. Such indeed is art. And it is clear that similar terms might be used of an ideal society. Art gives an approximate definition of the state. For in an ideal state each individual should help all the others to be themselves, call out their positive powers, so

that from such perfect co-operation a larger freedom of social life shall spring. Every great work of art is thus virtually a lesson in good citizenship. And so, without superstition, and in no mystical sense, we might regard the power of creation in art as literally bringing the order and type of spirit to earth, and incorporating it in man's material life.

PRACTICAL CO-OPERATION BETWEEN ART AND MANUAL TRAINING.[1]

HAROLD PEYSER,
Instructor in Manual Training, Public Schools, New York City.

MANUAL training used to mean very literally hand-training; we aimed, by a series of exercises, to impart to the student notions of method and accuracy. I think now we are coming around to the view that, while these qualities are desirable and necessary, the aim of manual training is rather to cultivate an appreciation of the proper use of material in adaptation to ends. We are striving to bring construction and art together. Our schools are to lay the foundation of that good taste which will make us a nation of lovers of true, simple beauty. Manufacturers will have to see, then, that the commonest utensil of everyday use, turned out by the thousands, shall be beautiful as well as useful. To attain the truest beauty we must work out an object from its own conditions and not try to foist on it something that So-and So did a hundred years ago, it may be.

Necessarily a mere series of drill exercises — meaning by that fixed and dictated — would not help much in furthering our object. Their value is almost purely disciplinary in character; for example, if all the boys in a class made the same bracket, though it might be a good one, that would be drillwork; on the other hand, if we allow the boys to vary the proportions and shape of the bracket, within good limits and under some guidance, then we create individual interest and help to make a craftsman instead of an automaton. Manual training, it seems to me, is not the use of tools, but a training in the proper utilization of material. We are going to design a thing that can be used instead of merely using to learn a tool. We should have, therefore, a number of constructive models, admitting of original thought on the part of the pupil, and whose execution will show the qualities of the material he works in, its uses and its beauties.

In designing something for any given purpose, the first consideration is the fitness of the material determined upon — does it answer all

[1] An amplification of a paper read before the joint session of the Art and Manual Training Departments of the National Educational Association at Minneapolis, Minn., July 10, 1902.

the requirements of utility? Second, what must be the general form of the object for the given use? Art now steps in, refines the proportions and shape of this type form, converting the merely useful into the beautiful useful. We cannot separate these two elements without harm. The truest beauty is constructional in its nature; one could not find a better example than the Doric architecture. There can be no true art without true construction. Beauty is not a luxury, but a necessity in our lives, and ought to be present in the humblest things. The crude efforts of primitive man bear witness to this feeling. From the inherent beauty of the material is determined the nature of our design, which must be a part of the object, conditioned by it, worked out in it, not on it; design is not a study of abstract spaces and ways of filling them.

Of course, the first problems in designing would be very simple — say proportioning in two dimensions, as in a thin calendar back; then a study of refinement of lines, decoration of the surface; later going to three-dimensional objects.

There are many forms that manual training takes. I will use some of the more important ones and endeavor to show that the method of considering them all may be essentially the same. Let us take up constructive design in wood first. Say we want to make a bookrack.


1

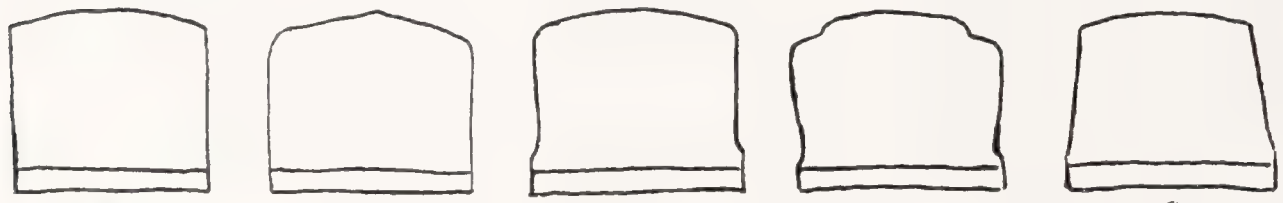
We are agreed that wood is eminently fitted for this purpose. We determine upon the approximate length, width, height, and the method of fastening the ends to the base; or we may reduce the difficulty of the problem by fixing some of these elements, as the length between ends. Here is the purely mechanical side of our work; it gives us a block form.

Now we try to make a satisfactory proportion between the various dimensions, bearing in mind the size of the books and their number. What are the characteristics and beauties of wood that we must take into account in modifying our type form? It is fibrous; therefore the lines of our design should be simple and strong. It has a grain which can be brought out by staining and polishing; therefore we should not use opaque color and hide the grain. In other words, our design should be strong, broad, woody.


2 3

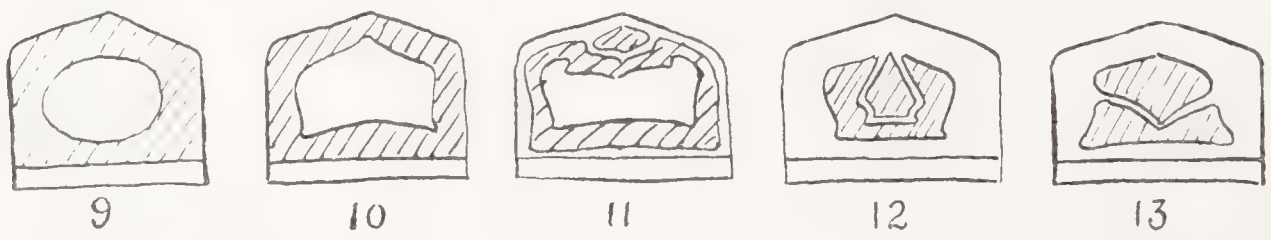
The first problem now might be to modify the end of this bookrack, keeping it simple, making no projections liable to be broken off, using

a line that is continuous and directive and that gives the appearance of strength. For example, contrast these two lines (Nos. 2 and 3). One has definite direction, it is purposive; the other is an aimless wandering. Here are a few ends that are part of a class-product.



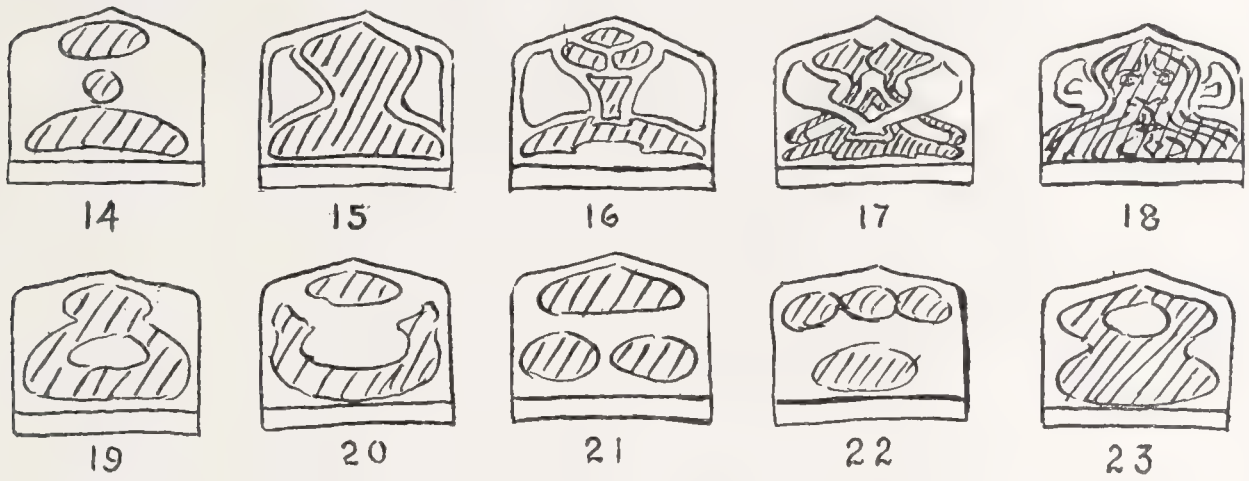
After the modification of the form we can take up the surface and work out of it a pleasing design that will stay flat, whose lines will harmonize with the shape of the end and its colors with the color of the wood. Certain simple truths present themselves here. We should not over-decorate, nor should we decorate a surface that is covered, as in the baseboard of the bookrack; further, we ought to bring out the structural characteristics and beauties; where the object is of a nature grave and massive, then likewise the decoration should be so, and *vice versa*. To return to the bookrack, what are the limitations of our design? The end is evidently the proper place for decoration: its chief points of interest are the base and the top.

Every design should be blocked out first in masses of light and of dark, the bounding lines of these masses harmonizing with the shape of the object; then we may leave these masses in their abstract form or work them up into various conventionalized forms. We may break up our surface into a central and an outer mass, which results in a border design; or we might break up the entire surface, giving an all-over design. Take any one of the ends shown, say the second. In No. 9 we have roughly indicated a central and outer mass; No. 10



makes the dividing line between the masses more in harmony with the shape of the end; No. 11 breaks up the outer mass a little. In No. 12 and No. 13 we take the central mass and break it up. We might use a different color for each mass or, if we chose; have one of the masses left the color of the wood.

A problem of more difficulty is to attack the whole surface. We must decide first where to place the dark and the light masses. It need hardly be said that in any design of a basal character more of the dark should be at the bottom and another fairly important mass at the top, and generally we need another dark to connect. Then we proceed as in the previous problem, making either abstract or conventionalized forms out of these masses of dark and light. Nos. 14, 19, 20, 21, 22, 23 show some arrangement of the darks. If we break the masses too much, we get a spotty design that lacks dignity. No. 14 is a rough blocking of masses. Nos. 15, 16, 17, 18 show this massing worked out in different ways.



It is well in class-room work to take a few simple massings first and have all the students work on those rather than begin with their own arrangements. The finished work ought to be low in key, with a deep, rich, and level color that should appear to be in the wood, not on it. A method of executing the designs which I have found to produce very satisfactory results is as follows: After the work was well sandpapered, the design was indented with a soft pencil; the wood was then stained with oil paint of the desired shade, rubbed in hard until it became dry. Black, burnt umber, green, yellow, Bismarck brown, and crimson were the colors used. With them could be produced almost any stain, either by mixing or by rubbing in one color and then another over it. The design was painted on with water color in washes of medium strength; it was allowed to dry, then outlined with India ink in $\frac{1}{16}$ in. line; finally, when all was dry, the surface of the wood was rubbed with boiled oil to which is added about 10 per cent. of hard oil finish.

There can hardly be any doubt as to which sort of work makes a more lasting impression upon the student, mere dictated work or that in which there is the interest of originality, of use, of beauty. We can

get all the necessary drill if our models are properly designed. Naturally, the early ones will be very simple, demanding little in design and execution, becoming more and more the product of the student's own thought as he advances.

When we come to a material like clay, opposite in all its qualities to wood, apparently one would expect entirely different problems to arise; yet the question is again the same: how a given material is to be worked up into the forms best adapted to it, and with a truly artistic result.

For elementary work simple containing vessels should be the models, developing later into more elaborated forms, as, for instance, beginning with tray forms made by rolling a lump of clay flat and turning up the edges, working up to bowls, jars, etc.

As an illustration of the method of design we will say the problem is a flower vase. We can narrow the problem by fixing an approximate size; in any case, certain considerations hold: the vase must be stable, of a size to hold a fair quantity of water; its shape should be determined by the flower and whether it is to hold few or many of them. A scheme which I have found very successful is to assume one dimension, say the height; in this case call it about 12 in.; then proportion the width to this, say 5 in. Fix upon the size of the vase and the mouth; next we determine the position of the tangent line, which may be above or

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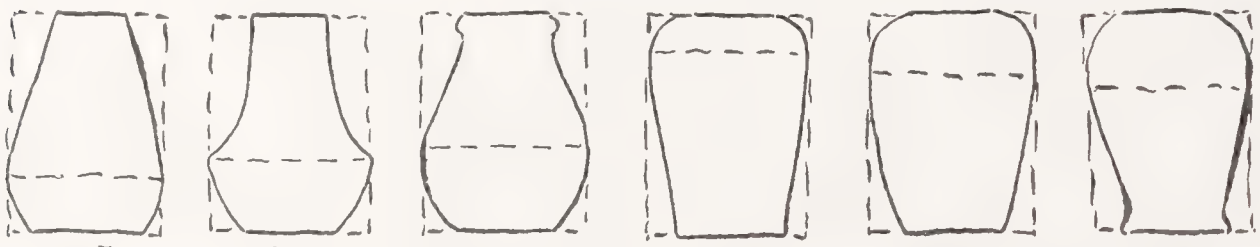


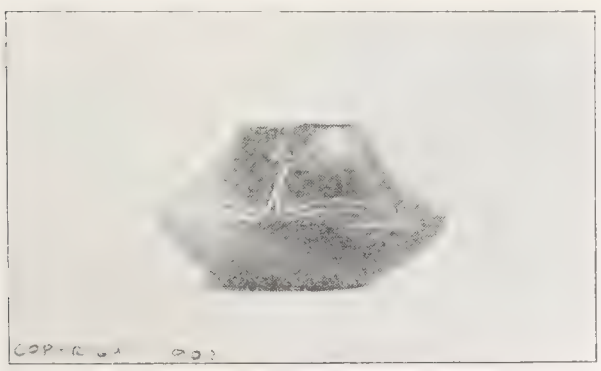
25 26 27 28 29 30

below the middle; then draw the outlining curve—it should be graceful, springing, yet strong and directive. It is possible to get an immense variety of forms in this manner with any given set of proportions. For example, Nos. 25 to 30.

With regard to the surface treatment, a vase should not be treated as a surface for a painting or for elaborate relief work. A beautiful landscape, or portraits, or flowers have no business on its surface; they belong on a canvas or other flat surface. Likewise sculpture does not belong there. We may glaze the surface either in a monochrome or a shaded tint, or we can break it up by a modeled decoration which should be simple, broad, flat, abstract, and characteristic of the form. If this is low and broad, then the line must suggest stability and weight; the design should give emphasis to the base and mouth, be weighty; its effect should be horizontal. If the form, on the other hand, is tall and slender, then the line must suggest an upward growth or spring: we should emphasize the vertical element. I present some vases which were designed after this scheme. In form A the horizontal bands give the horizontal element required, while the remaining bands bring out the curve; the fact of most of the decoration being at the base gives the necessary weight. Form B hardly needs any explanation.

A

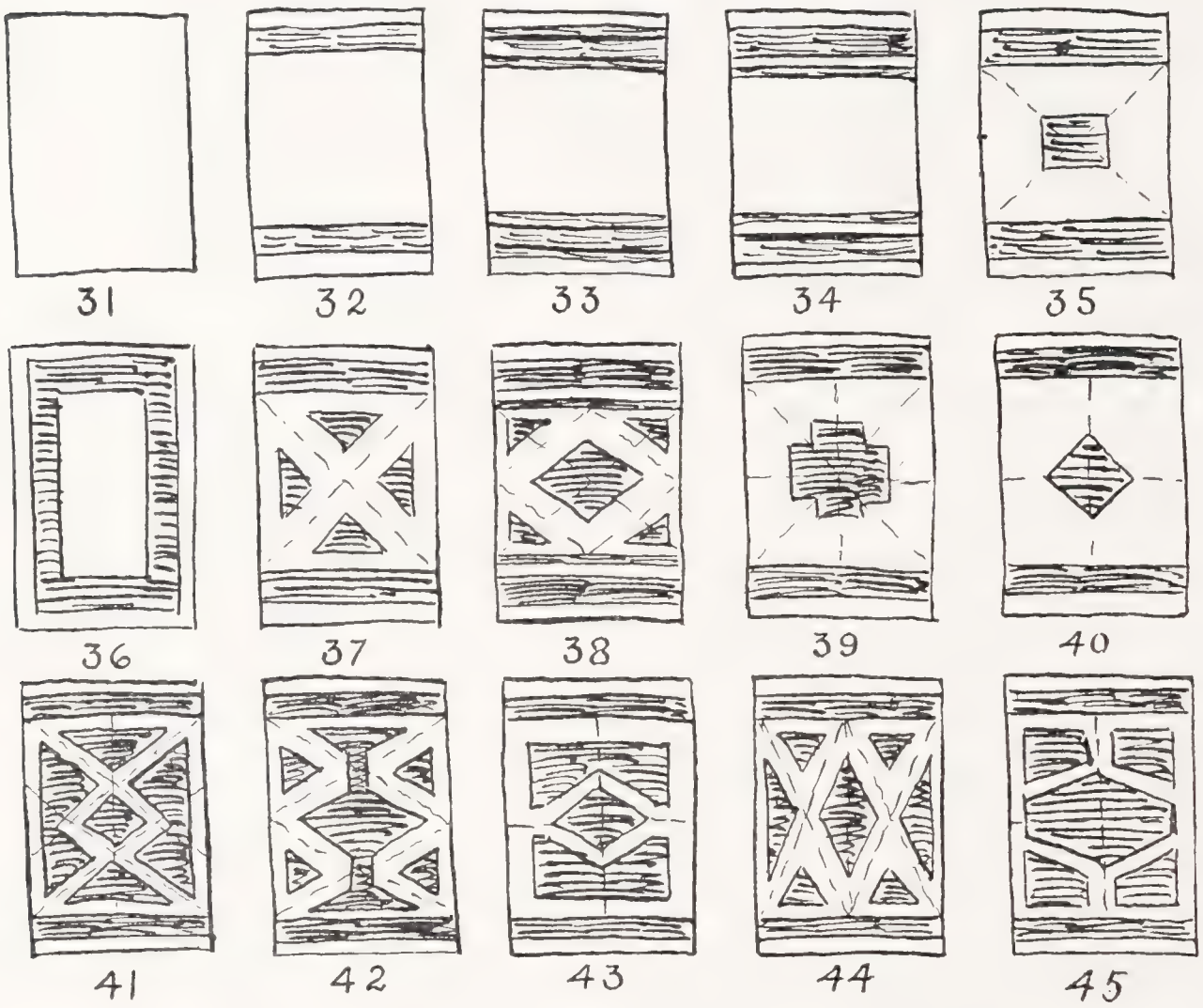
B



We have not fully recognized, it seems to me, the splendid opportunities that weaving offers for the cultivation of the art sense, or, to put it differently, the recognition of "fitness." The rudest kind of a hand-loom is all the apparatus needed; for weaving material we may use what can be obtained or dye our own in advanced work, bringing in some study of dyeing. The closer we are going to adhere to the limitations and feeling of our material, the finer will be our product. How well the weavers of the East understood this!

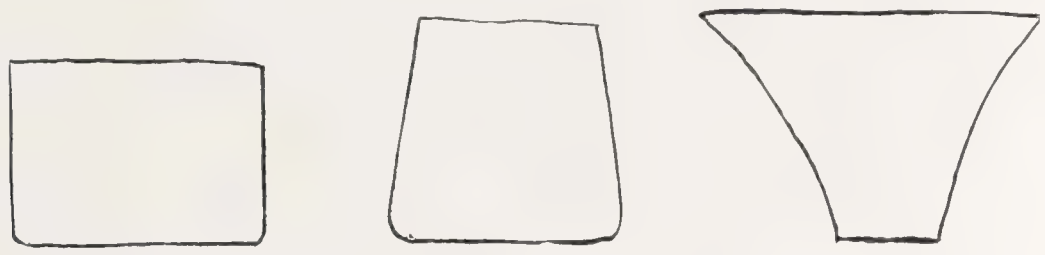
In working out a woven fabric we ought to take into account many things—its use, the kind of thread used, whether of uniform or of uneven thickness, the color, the method of weaving. The plainer the mechanical side of the weaving shows in a fabric, the simpler and more mechanical it should be in design. Where this is not so evident we may become more elaborate.

Our forms are either of a definite size or in continuous lengths.



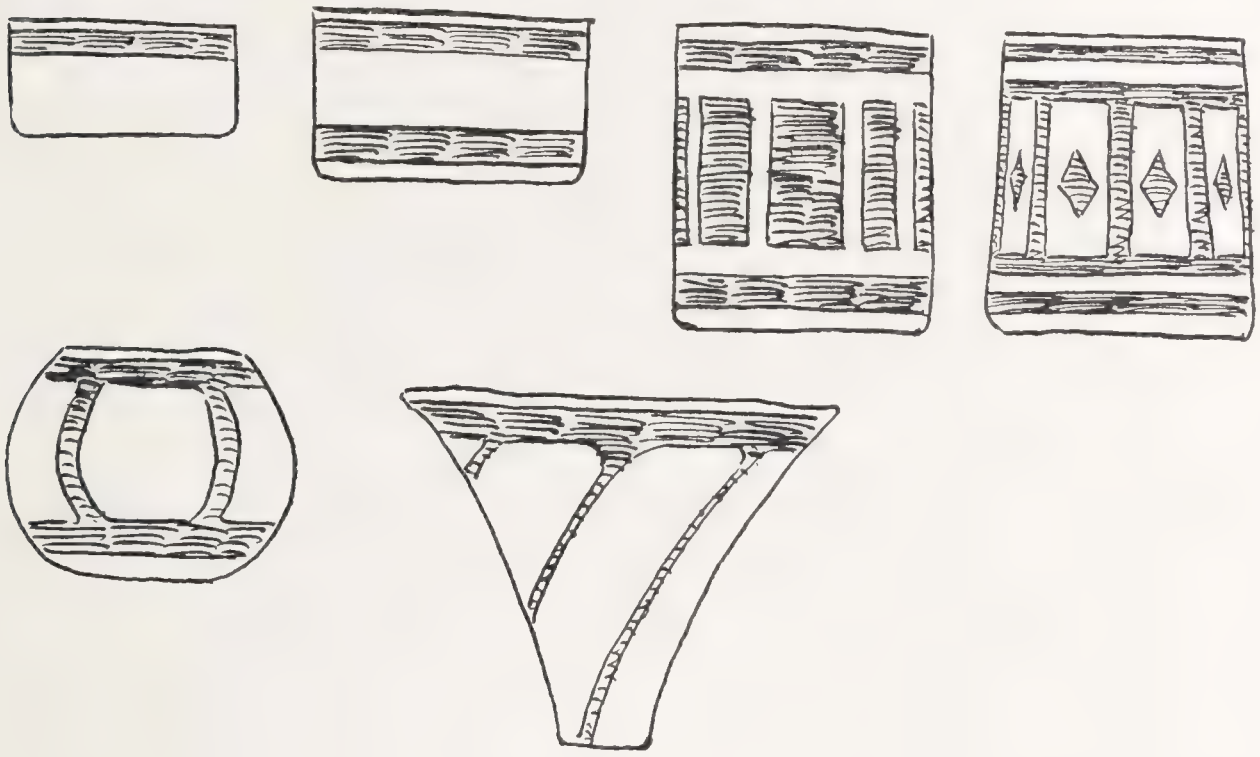
Take a rug as the problem for design: What proportions shall we give it? What material do we want to use? What shall be our ground color? How shall we proceed with our design? A band, or a series of them, at the ends of our rug to emphasize the fact of definite length, is the natural first step in decoration; a further step would be to continue the bands on the sides of the rug. We have now a center and a border space to attack. I suggest here a possible series in elementary weaving. No. 31 is to show the method of weaving; No. 32 is the first problem, the use of one band; No. 33, one band made up of several others; No. 34, more than one distinct band; No. 35, a simple center in addition to the band or bands; No. 36 might perhaps be

dropped; No. 37 and No. 38 work out the center space further. The other sketches illustrate a method of evolving simple designs by breaking up the center in various ways. The resultant color effect of the rug should be low-toned and level—no color should "jump out" or we lose "flatness." The design for a continuous weave would have no



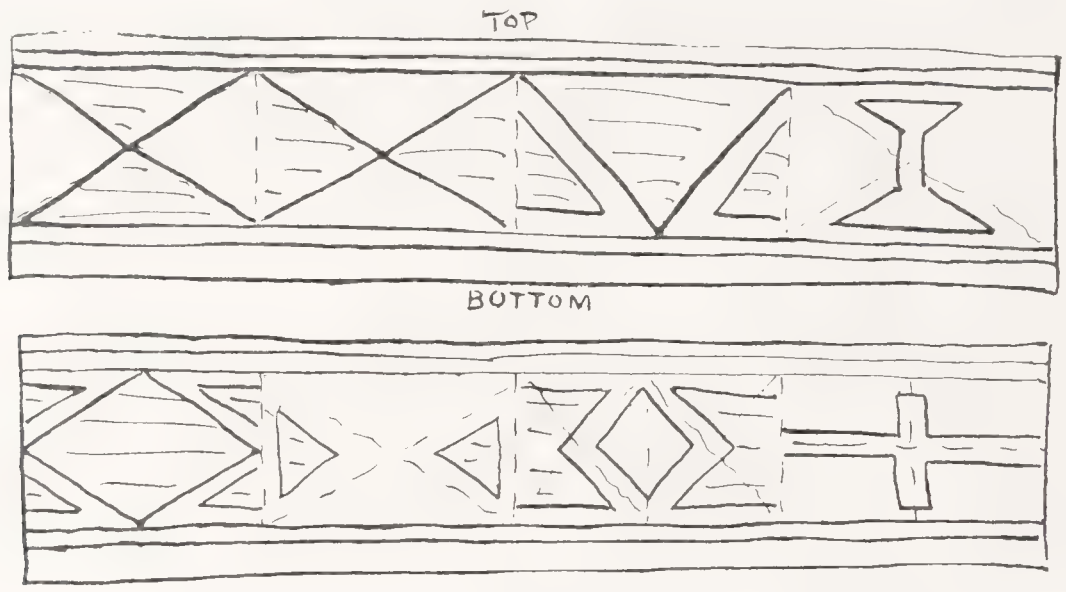
definite direction, unless the use of the material made it necessary as in a belt.

If basket-making is to have a real value as manual work, then we must stop imitating Indian productions and instead let the material work itself out. Very likely we shall not get such fine baskets at first, but the results will represent true efforts in design. We should study what materials are suitable for basketry, the fundamental weaves, the



question of strength as influenced by weave. The first models would be mats, then shallow trays, and on to forms with greater height. Our decoration should follow the weave. In low forms the horizontal element predominates, in high ones the vertical. The band would naturally be the simplest decorative effort; then we have the stripe,

combinations of these two, and lastly designs that work over the whole surface. We can work out the shapes in exactly the same manner that was used for the clay forms — by the use of the rectangle and the



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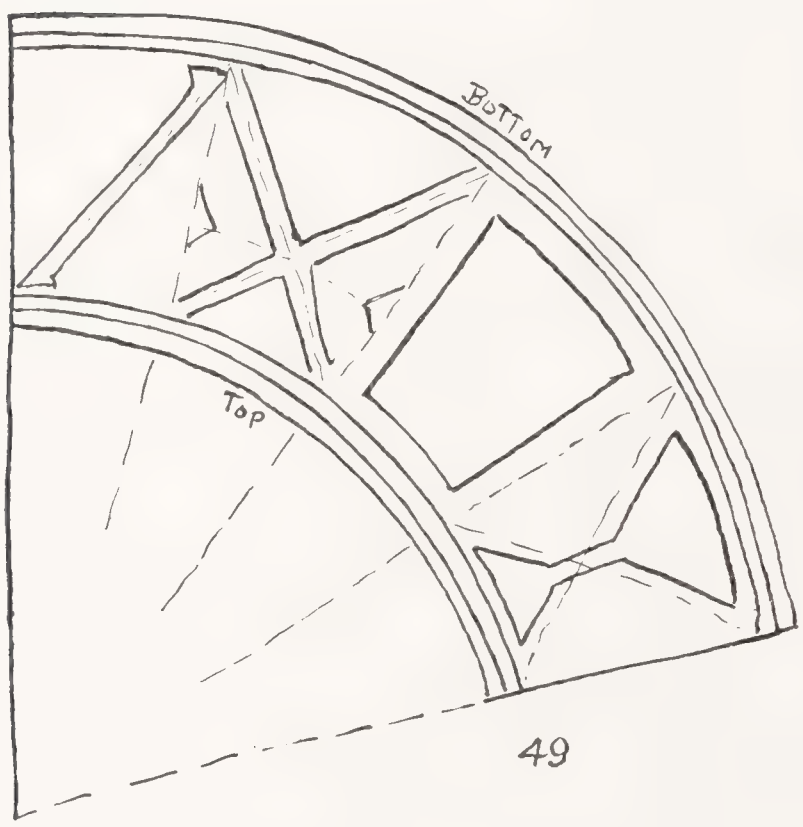

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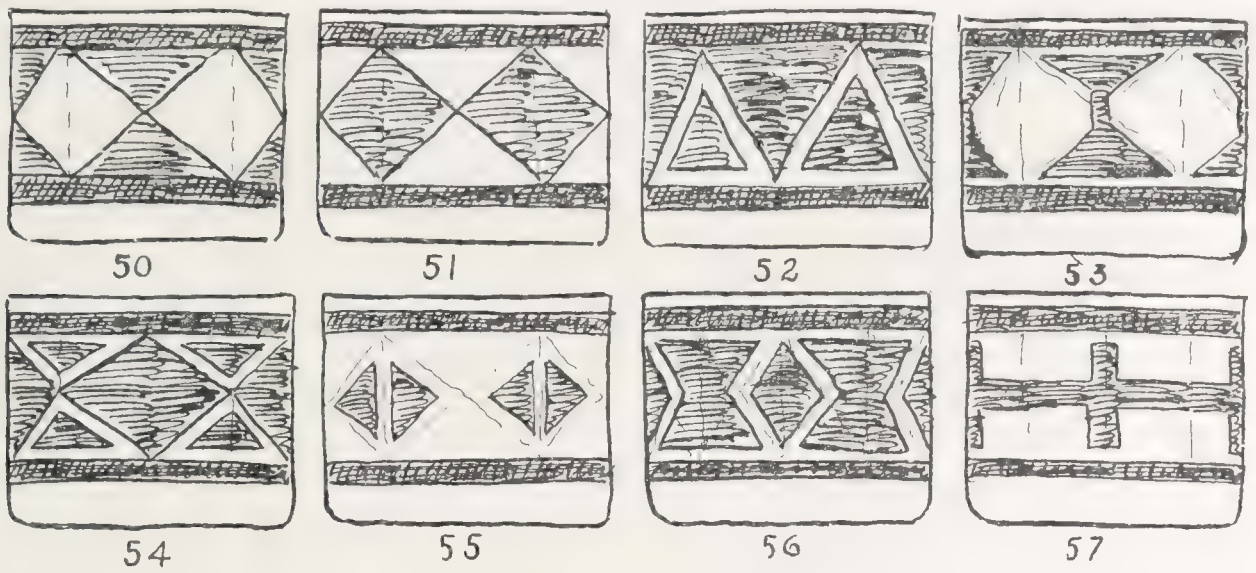
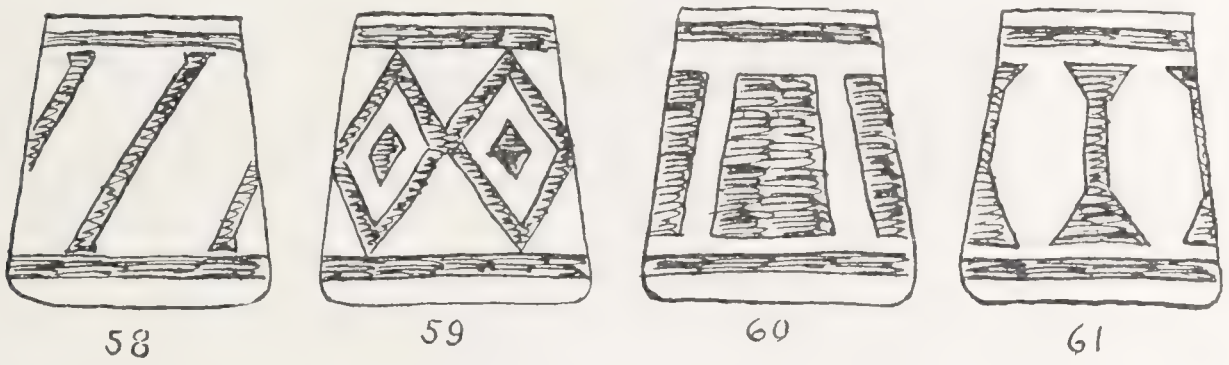
tangent line. As in the previous examples, we take the given form and find out its points of interest; then we break up the surface into masses and treat them in various ways. A method of working out the design is to use the developed surface. All forms with vertical sides 1 would treat as rectangles, conical and curved forms as sectors. To illustrate, take two or three forms, say the following :

Figs. 48 and 49 show how it is possible to originate by this simple means any number of designs. Figs. 50 to 61 carry out the development.



I have tried to show that, no matter what material we are dealing with, the method of design is the same. We want to make something; we decide upon a type form, which is then proportioned as finely as possible. This type form is to be modified into a beautiful form. From a study of the material, the method of construction, the use and form of the object we evolve the decoration. If manual training, in its



broadest meaning, is to be any help in making our craftsmen and workers, then it must result, not in mere skill of hand, but in a mind trained to understand how the crude products of nature are to be turned into things useful and beautiful.

ART IN THE CRAFTS.

HUGO FROEHLICH,
Pratt Institute, Brooklyn.

"BEAUTY—which is what is meant by art, using that term in its widest sense—is, I contend, no mere accident to human life, which people can take or leave as they choose, but a positive necessity of life, if we are to live as nature meant us to."[1] This need for beauty plays a part in our lives second in importance only to that of utility. Consider the furnishings of many modern homes and see how beauty is or attempts

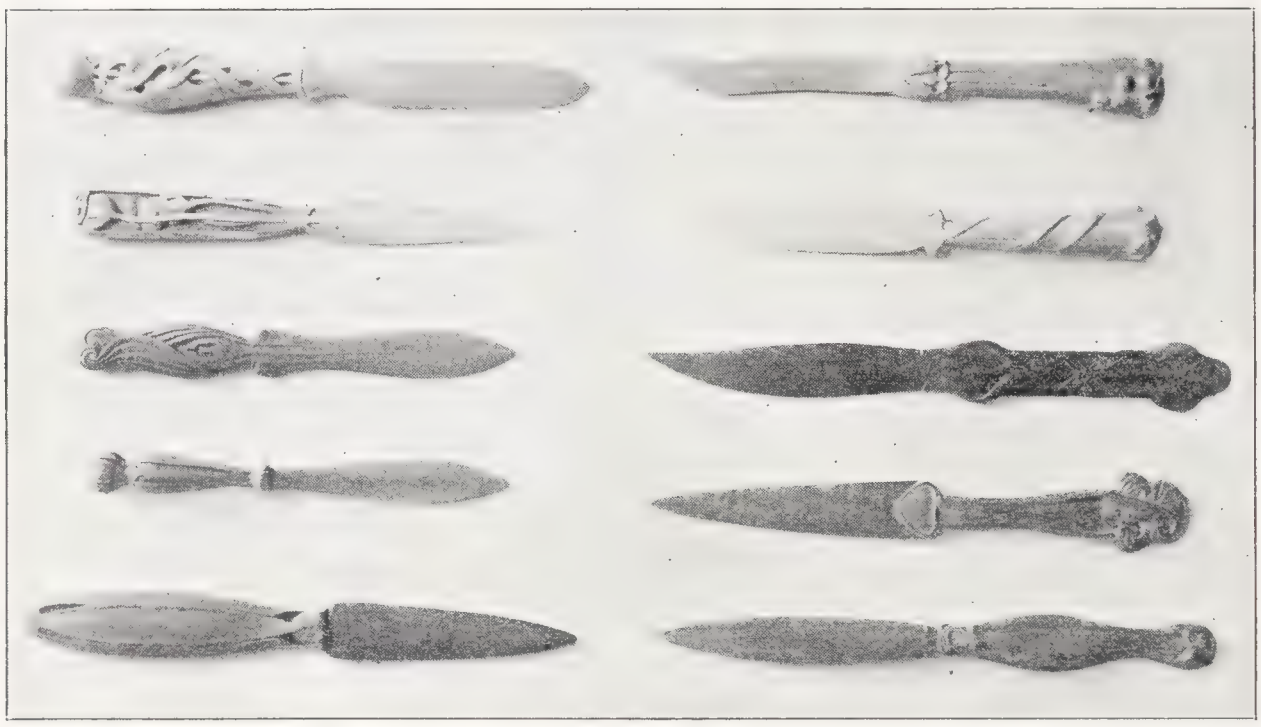


FIG. 1.

to be a part of them, nearly every object having, besides utility, some ornamentation. True, most of these are decadent or inconsistent, but they exist because of this desire for the beautiful. In the purchase of a household article beauty is one of the requisites. Why, then, are so many homes a collection of inharmonious articles whose silent, but nevertheless aggressive, quarrels wear on our nerves? The causes are two: the lack of taste or ability to tell why an object is or is not beautiful, and the spirit of mistaken commercialism that tends to crush the inventiveness and individuality of the craftsman.

Acquiring taste is to familiarize ourselves with the good and beautiful, to train the mind to understand the principles underlying beauty.

[1] William Morris.

For instance, these paper-knives (Fig. 1), aside from the conditions of utility, have fine line and well-distributed masses and good color. The outer edge of every knife is a carefully studied boundary, inclosing shapes and lines whose arrangement offers good opportunity for eye music; long swinging lines with just enough of short, snappy curves to give variety; finely related large and small areas, whose combinations produce a pleasurable sensation. There should not be too many long lines or large areas in such pieces. This means monotony. On the other hand, a preponderance of short lines and small spaces ends in unrest and lack of dignity. In the distribution of the light and dark masses, the parts in relief express the light, and the under cuts stand for the dark. In this, as in line effects, too many undercuts produce a scattered appearance, while many unbroken, large areas result in sameness. If color adds beauty to the carving, employ it, but do not let the character of the wood and its grain be sacrificed.

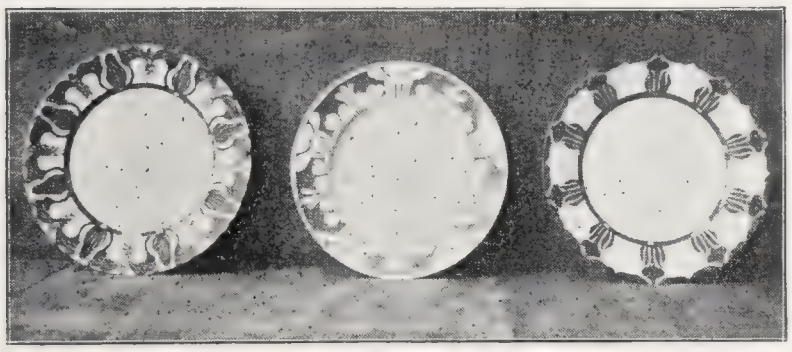


FIG. 2.

These considerations but hint at the qualities essential to a true artistic creation. Without these, the work will be commonplace. As an instance: the stores are flooded with burnt-wood and leather articles, nine-tenths of which are without art merit; and yet pyrography is a beautiful medium, and in the hands of a Fosdick is the means of expressing noble art. Without invention, judgment, and individuality all attempts in the crafts direction are void of art; hence the need of a training of the mind in the laws of beauty.

FIG. 3.

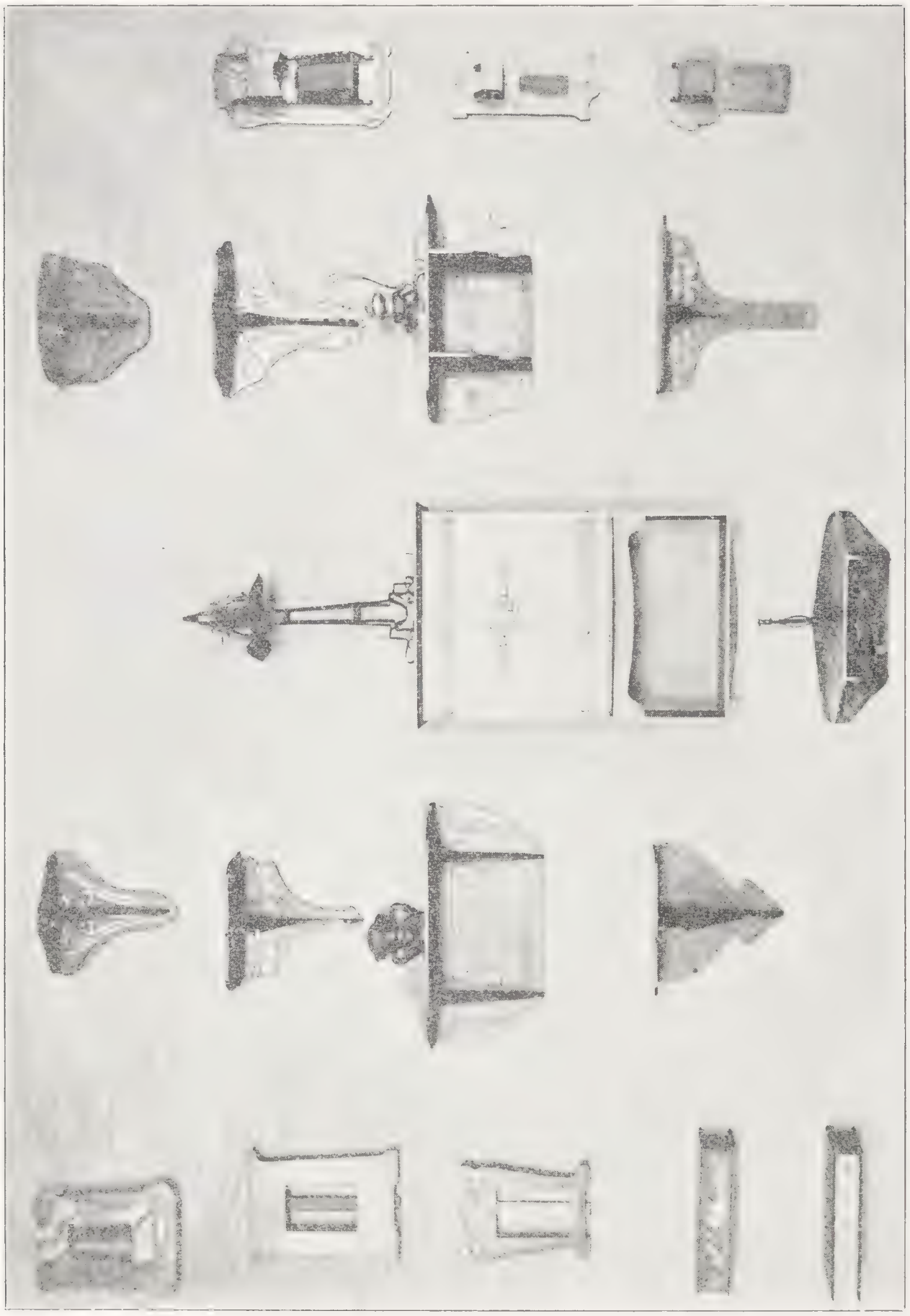


FIG. 4.

For splendid line quality and motives nature offers in her plant forms a storehouse of material. The Japanese and Chinese are masters in rendering the vital line quality of nature, and reflect it in all of their work be it a print, a bit of carving, or a bronze; there is always that subtle, sure, splendid quality. With them it is a power, and by having our students attempt to approach this charm of line, they, too, acquire some of this power and in their turn reflect this kind of beauty in their work. For motives, the top, side, and back views of buds, seed pods,

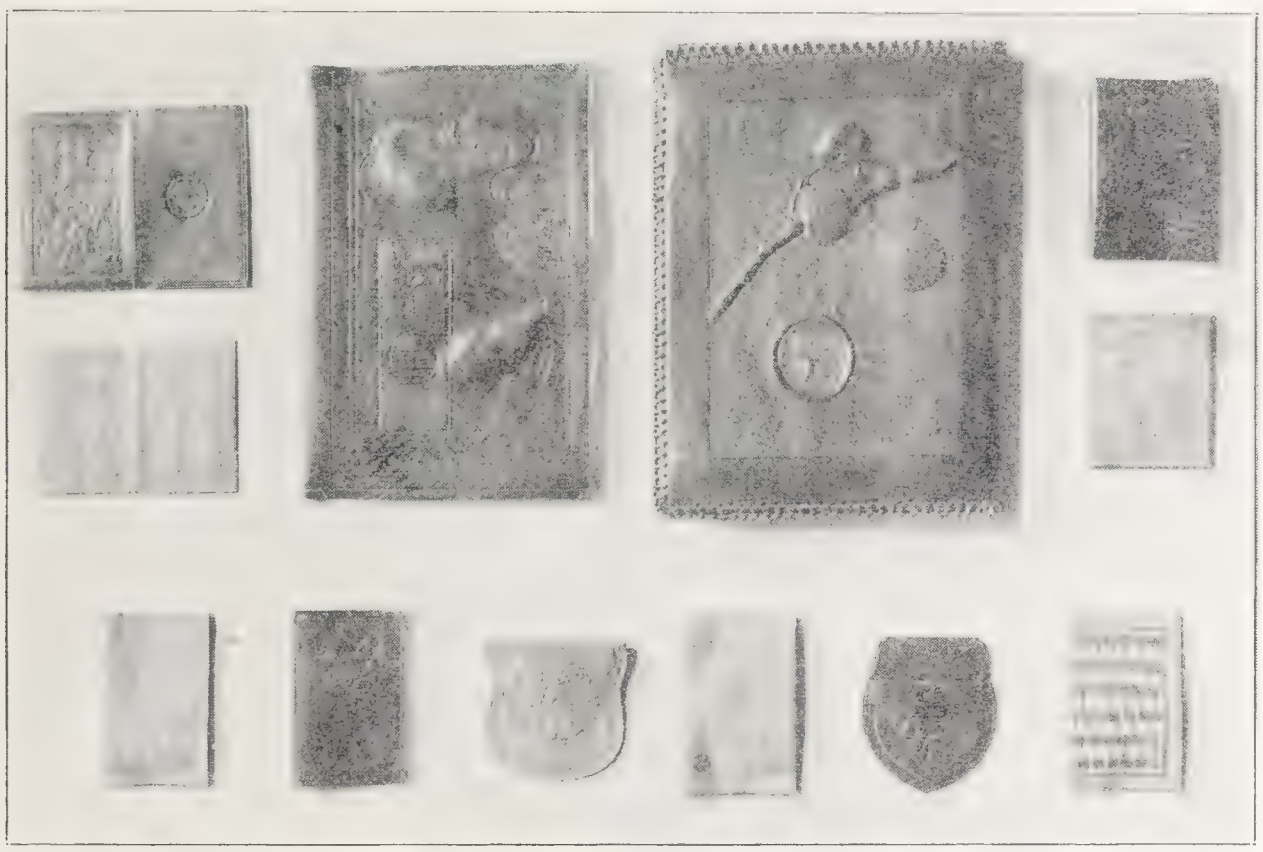


FIG. 5.

flowers, and leaves offer suggestive shapes; the cross-sections of flowers and pods give interesting patterns that serve to stimulate the fancy into creating new combinations. Some of these are used in the plate designs (Fig. 2). In the baskets (Fig. 3) the design is not based on nature, but on an orderly arrangement of straight lines inclosing color shapes of several values. Here color plays an important part and offers possibilities for individual expression, for no two people think alike in color. Briefly stated, a development of the color sense depends on a progressive series of color exercises that will give the mind ability to create and judge color harmonies. In the brackets, boxes, match-safes, and picture-frames of Fig. 4 an attempt was made to combine the decorative with the constructive elements in thin wood models. Some plant form was chosen as a motive and the following procedure

adopted: After a study of the significant line qualities of the plant, a sketch of the project was made in which the outer contour and decorations were related, fitness insisted upon, and limitations of material considered. Following this came the construction and decoration. The final test was to secure such a relation of the parts as to produce a unified whole.

The reproductions in this paper are taken from articles made by students of the art department at Pratt Institute. In taking up a number of mediums, such as pottery, metalwork, stained glass, wood-carving, leather-modeling, basketry, etc., the idea of gaining proficiency in all these was not thought of, as the time is too limited for that; but the students aimed at extending their art horizon, understanding the possibilities and limitations of mediums, and gaining the ability to make combinations. For instance, a lamp and shade requiring pottery for the oil well, metal for the lamp stand, and leaded glass for the lamp shade were carried through. Again, a screen problem required the combination of wood-carving, leather-modeling for panels, and some metal for trimmings.

Craft work of this kind, if it has art merit, does missionary work in the home. It has a right to a place with the best in that home; for a mind that has once tasted the joy of creating usually continues to create and slowly transforms its own surroundings into harmony.

ASSOCIATIONS.

NATIONAL EDUCATIONAL ASSOCIATION.

THE Minneapolis meeting of the National Educational Association, July 7–11, was a decided success. The weather was fine, the city and the surrounding country were as beautiful as they had been represented to be, the people were as cordial and the program as inspiring. Among the notable addresses of the convention were those by Archbishop Ireland, of St. Paul; President Butler of Columbia University; Professor Dewey, of the University of Chicago; and Hon. Michael Sadler, of London, England. Of these, the one by Dr. Butler has called forth the widest comment, not only because of the high place the speaker occupies among American educators and American citizens, but because his address dealt with two great problems of vital interest to educators, parents, and all who contribute to the support of education. These were: first, the elimination of waste from our methods of education; and, second, the restoration of the Bible as a literary classic in the schools. In considering the latter, he said: "When we study the ancient civilizations, one of the first things to which we give attention is their religious books. And yet we are trying to teach Christian civilization and a knowledge of Christian literature while excluding from that instruction all knowledge of that book which is the basis of all that is best in our literature. From Chaucer to Browning our literature draws liberally from the eternal springs of our sacred Scriptures. And yet we are undertaking to educate our children and make them scholars in literature without putting into their hands that great literary masterpiece, which is the foundation of the whole literary structure."

No event during the convention caused more general satisfaction than the nomination and unanimous election of President Charles E. Eliot of Harvard University to the presidency of the association for the coming year. This election, coupled with the announcement that the next meeting will be held in Boston, insures a noteworthy meeting in 1903.

The sessions of the Department of Manual Training were better attended than ever before, though the number of special teachers of manual training was not so great as last year at Detroit. The room selected for the sessions was well suited to the needs, it being the chapel in the new library building of the University of Minnesota. The first session opened on Wednesday morning, with Professor Charles R. Richards, of Teachers College, New York, in the chair. In the absence of Secretary Trybom, Mr. H. A. Davis, of the Hackley Manual Training School, Muskegon, Mich., was appointed secretary. A nominating committee was appointed, consisting of Charles A. Bennett, of Peoria, Ill.; George G. Greene, of St. Cloud, Minn.; and Principal Walter W. Shaffer, of Newark, N. J.

The first paper of the session was presented by Arthur W. Richards, of the Ethical Culture Schools, New York city. His subject was

FROM THE PRACTICAL TO THE INTELLECTUAL IN THE SHOP.

Mr. Richards wished his hearers to think of the title of his paper as suggesting a movement, not a goal — a movement no less marked in the development of the arts

and industries of the world than in the teaching of handwork in the school. Even in religion and philosophy this same movement is evident. Progress in all these activities of life is "ever toward a greater intelligence concerning the processes and laws involved."

"The moderate and crude rule-of-thumb methods of the crafts and trades of old; the contentment of a son with the craft of his father; the simple home-made paraphernalia of life with their homely and human touch; and, finally, the leisurely day necessary to give this lingering touch, are fast dropping from the ways of life. Regret for this the author shares with many; yet the world ever moves on, and no artificial resurrection of the arts and crafts of old will stay those real movements which are organic.

"But the time is at hand when the arts and crafts of old — picturesque and human as was the art they gendered — do not represent or cover, by a long way, either as to motive or matter, those constructive activities of man which are expressed through the work of his hands. Little wonder that the age of crafts and primitive forms of industry and the present age of steam and electricity show not immediately marked common factors. Man is, however, very much the man he was, 'a tool-using animal.' Because his tools have become infinite and complex, and the forces subject to his intelligence surpass the highest flights of the imagination of his earlier day, shall we say, therefore, as we may no longer hail him as craftsman, that he is a less worthy kind?

"This matter of values in differences of kind bothers us sometimes to balance, so often is it more of one than another kind with which we have dwelt. It was under such stress, in fact, that the several forms of handwork entered the school — through the familiar kinds, not through philosophic considerations — from the technical school on the one hand, and the kindergarten on the other, with an intermediary movement springing from and devoted to the home and household interests.

"This latter movement, there is some reason to think, will move on under the pressure of the art and æsthetic interests into the arts and crafts point of view. If so, again will manual training fail, as it has in the past failed, adequately to represent in the school the workshop of the world as a social and civilizing factor in the life of man. For, failing to represent the workshop of *industry* and *science*, it fails to represent too many important human and world-interests, and omits material of too great educational value.

"This material, which has come into the workshop of the world through the impulse of science, discovery, and invention, is, it is believed, of special significance to the child of the elementary-school age, considering the needs of motive, intellect, and imagination.

"From the workshops of industry and science come those servants and tools of man which are the attractive features of the world of action which he sees about him, the factors which give it go and action, ever challenging his curiosity and understanding. But is this not just the appeal we should expect of these things to him who is in nature something of the man concerned with making the mysterious in nature subject to his intelligence?

"More than this, is not the dominant impulse of the elementary-school age an impulse to acquire a larger grasp of and intelligence about man's world and its activities? And, though we may leave by the wayside multitudes of ordinary impulses, are there not some large and dominating impulses which we should hardly be justified in

not considering, so much do they seem to indicate something of 'the nature of the living principle within' with which Plato would have us start, and so much is it necessary to consider them, if we would 'order their lives for the best,' as is his injunction?"

After this introduction, Mr. Richards proceeded to discuss the question: What material offers the most fitting food for these larger impulses? He considered the material which science and invention have given to the workshop in its relation to the needs of the elementary school. Three aspects were taken up: first, the material as concerns the nature of the motives which it lends to the work; second, as concerns the intelligence which it lends to the activities; and third, as concerns the qualities it lends to the imagination.

"Considering the motives which may be associated with our handwork, the question is: What desires, what ends, shall we consider of most worth as the conscious impelling and directing agents of the activities, when valued according to the social, ethical, and intellectual life and purpose to which they lead? Have those superior worth in this direction which constantly seek the æsthetic, the beautiful, the emotional; or must this place be given to those which seek delight in the rational, the philosophic, the perception of purpose, law, and order in creation? Or shall the honors be divided between these two types?"

In answering these questions the speaker said:

"Exterior form as a pleasing effect may be the end held before the mind in our constructive work. Now, if this end be given first place in the mind as the motive of our handwork, it leads most naturally to such work being selected as allows of the maximum freedom in exterior form and in which the functional and mechanical determine only to a minimum what the form shall be. Very readily, then, does a preponderance of conscious attention come to be given to this matter of appearance, with which, I submit, both the social and the school atmosphere are already sufficiently charged.

"Let there be no mistaking what is meant here. It is effect in appearance as the conscious and all-important end in the child-mind which is considered as dangerous and corrupting, and not appearance which is a result and natural attribute of that which is admirable because constitutionally sound and adequate.

"The objection, therefore, is to giving a minor attribute the major place in the child-mind — to starting at the wrong end.

"And so it is held that the manual work of the elementary school, to a large extent, well may be given over to a type of work the forms of which to a maximum degree call for the consideration of the functional and mechanical content, and this precisely for the purpose and advantage of placing the preponderance of attention on the content rather than the form — giving the major attribute the major place — starting at the right end.

"Nothing deprecating the value of the æsthetic as a force in the world of action or in education is intended here; but that this value comes only through the influence of the fine arts is held as a reasonable doubt and considered inadequate as a conception for the educator."

In discussing the second aspect of the question, Mr. Richards pointed out that

"A full intelligence upon the part of the pupil is necessary, if anything valuable as to means and method is to be conceived and given birth. As manual training, no means or method, tool or practice, just because representing good usage in a trade or

craft, is so important or valuable as that means or method conceived as fitting from the fulness of the worker's intelligence. Again the plea is to give the major place to the major consideration, that the minor may be given its just and real bearing and import to the whole. And I would suggest the significance of this to the practical problem of treating large classes by raising the question as to whether forty workers, with an intelligent and broad view of a matter, or forty who have in mind merely the immediate bearing of that move with which they are at any time occupied, make the greater problem. Does not the answer to this indicate that of first concern is the matter of intelligence about the problem in hand?"

The speaker closed his paper with a concrete illustration — an outline of "a *study* of *the* water-wheel — not a *model* of *a* water-wheel." This included (1) a historical sketch, (2) the physics involved, (3) the mechanics involved, leading to a consideration of the types of wheels, and (4) the problem of design and construction. (See an illustrated article on "The Thought Side of Manual Training," by Mr. Richards, in the MANUAL TRAINING MAGAZINE, January, 1902.)

The second paper of the morning was read by Mr. J. E. Painter, supervisor of Manual Training in Minneapolis. His subject was

THE FIELD OF THE SHOPWORK IN THE ELEMENTARY SCHOOL.

In this paper Mr. Painter showed clearly that he fully believes in having a *course* of study in manual-training work. This, however, should be a course of principles or fundamental operations capable of wide application, rather than a single series of models or exercises.

"It is a principle of all good teaching that the spirit and character of the work should be in accord with the best interests and highest possibilities of the pupil. It is evident, therefore, that any series of exercises or 'bodily acts,' in order adequately to represent these interests and capabilities, must be broad in their application. They cannot be circumscribed by the narrow limits of any set course of models. No better can they be served by turning the boy loose in the shop and allowing him to make such use of the tools and materials as suits his fancy."

Mr. Painter believes that it is the business of the teacher and the school environment to influence the choice of the pupils as regards what they shall make. "Nothing succeeds like success, and for this reason the pupil should not be permitted, much less commanded, to undertake anything which he cannot do well. He should proceed by easy stages from the simple exercises to those of more complex nature, and every object completed should represent the best that he can do. Nothing less than this should satisfy him. Nor will it, if his activities are wisely directed at every stage of his work. Notice that I say "directed," not "led." It is possible to lead a pupil until he becomes a mere blind follower, an imitator, with no power of initiative — no individuality. But by wise direction or supervision his power of initiative is developed — his individuality cultivated.

"In manual training, as in any other subject, there are certain fundamental principles that cannot be omitted in the training, and it is this fact that makes the course of instruction necessary."

Mr. Painter's paper closed with a plea for better-educated teachers of manual training.

DISCUSSION.

A general discussion followed. Mr. W. J. Warters, of Winnipeg, emphasized the desirability of blending thought and action in manual-training work. Mr. Clarence

V. Kirby, of Denver, recommended modeling and basketry, and said a good word for sloyd. Mr. C. A. Bennett, of Peoria, said the thing he feared in some of our manual training was a kind of short-circuiting. "The psychologists have pointed out that there is a mental circuit, or an organic circuit, as they call it. First there is the sense stimulus acting upon the central organ of the mind, the result of which is an impulse to motor action going out. This motor action in turn modifies the sense stimulus, and so the circuit is completed. In some of our manual-training work it would seem that, instead of passing directly through the central organ, the current is allowed to pass around the edge, so to speak, where the least possible amount of thinking is done. The distance from impression to expression — from sensory to motor — is thus shortened or made easier, but with a distinct loss of power and interest. Such work will kill originality. This kind of cutting across — of short-circuiting — is dangerous. In emphasizing the importance of the thought side of manual training Mr. Richards has made a valuable contribution to the discussion of manual training."

Professor John F. Reigart, of New York city, said that for a quarter of a century we have been told that we should have an education of head, heart, and hand, but we must remember that doing a thing does not necessarily involve mental training. The problem of manual training is to give such work as will enable the pupil to develop on all three sides. Greater interest is needed, but not sentimental interest. Sense-training is important, but the training of the judgment and reason is more important. Any model which involves a large number of successive steps is better than a series of isolated points. Mr. Richards has pointed out that it is possible to have the series involve more mechanical principles. In the construction of the water-wheel the pupil is thinking not so much of the toy he is making as of the principle involved. The question to ask ourselves is not what sense is being trained — what this tool does for the child, what that; but what effect will it have upon the ideal world of the individual child. We all live in different worlds. The child has a right to live in the greater world. The primary question then is: How will this work fit into the needs of the child?

Mr. Shaffer, of Newark, related his experience in starting manual training in a school in the Italian quarter of his city. Before it was introduced the school was a "howling mob." When the work was begun the regular grade teacher went into the manual-training room to keep order and the principal went to help the grade teacher. Under these conditions the special teacher could give the necessary instructions. Four results were noted. First, the principal was no longer needed; then the regular teacher was not needed to keep order, and so gave his time to assisting the special teacher in giving instruction. The demand for manual training became so great that the small boys would ask if they might take manual training the next year, if they were promoted. It affected the whole tone and spirit of the school. Finally, some of the pupils were greatly benefited by being able to get good positions on account of their skill gained in the manual-training class. Considering the short time that children in our cities remain in school, Mr. Shaffer believes that it would be better to take time from the exacting studies and put it upon manual training. "A manual-training teacher ought to be in every large building all the time. If anything must suffer, cut off something else, but put in manual training."

In closing the discussion, Mr. A. W. Richards said, in part:

"Now, the point which I wished to make in my paper is precisely this: that we must get back of the sense-training, to the intellect — intelligence. It is this which

is being trained and modified, not the senses; and the point is that, unless our hand-work does get back to the intelligence, does awaken the purpose, does leave there something which will carry over into adult life and purpose, our work won't amount to much. And, further, the point which I wished to make very potent was the question of kinds of material which most fittingly work out this purpose of intelligence, and also that it is a question of kinds of material as fitting specific ages. I mentioned "the living principle within," and it occurs to me that this is probably the same thing that is meant by nascent periods, except in the one case the living principle within is perhaps not considered as varying in different periods. Mr. Reigart referred to the desirability of the boy having in mind an ideal world. This again is a point which I wish very much to make plain, that his ideal world is made up from the real world which he sees about him; and it is for this reason that I would see to it that this real world is presented to him in its broad aspect, and that the work, therefore, be associated with the world of large affairs, as are history, geography, and other school subjects.

"Now, I wish to mention the three divisions of the school briefly in connection with manual work—the elementary, grammar, and high school.

"In the elementary schools the forms of work, having very little technique to them, may be very broad, having both the free modeling work and constructive work, not differing so very much in the demands on the child's constructive imagination. When we come to the grammar grades, however, it is another question. The child has come to the age where he is beginning to see more, discriminate more, the realities in things. He is beginning to discover the technique, as it were; and to satisfy his intelligence we must deal with it somewhat; otherwise his work becomes simply so much doing, without much intelligence. It is for this reason that it is desirable to select such forms of work for this grade that this need is supplied. Coming to the high school, we have still another question—perhaps earlier than the high school. Individuality begins very plainly to assert itself. In the eighth grade perhaps we shall find that difference is being shown in the individuals in the things they care for, some showing more marked tendencies toward the technical and engineering forms of work, others equally marked tendencies toward art forms of work. When we get into the high school, this differentiation is still continued, and in the interest of a broad high school it seems to demand very many kinds of work. It seems to me this will work out finally by having a great variety of the industrial arts there. It may be that one individuality will find its greatest joy, expression, and power in work in clay-modeling, pottery perhaps, or some such thing. Another individuality may find its greatest satisfaction in cabinet work; etc., etc. Now, it seems to me that it is in the high school especially where this question of individuality is most to affect our manual work, and I would wish to see the high school care for the student of classic and artistic temperament equally as well as for the one of technical, mechanical bent. But I would wish also to see it care for the student of technical and mechanical bent equally as well as for the one of classic and artistic bent."

OFFICERS FOR 1903.

Before the close of the session the nominating committee made its report, and the following officers were unanimously elected for 1903: president, Charles F. Warner, principal of Mechanic Arts High School, Springfield, Mass.; vice-president, E. J.

Painter, supervisor of manual training, Minneapolis, Minn.; secretary, Arthur W. Richards, Workingman's School, New York city.

The second session was a joint session with the Department of Art Education. Professor Richards presided, and, after a very pleasing musical number provided by the local committee, introduced Mr. Ernest E. Fenollosa, formerly curator of the Japanese collection at the Boston Museum of Fine Arts. Mr. Fenollosa's address is printed in full on pp. 1–9. The second paper was by Mr. Harold Peyser, instructor in manual training in public school No. 77, New York city. This has since been enlarged and is printed in full on pp. 10–19. The illustrations here shown fail to convey an adequate idea of the exhibit used by Mr. Peyser at the time of reading his paper, because they lack the very important element of color. Indeed, it was the soft and appropriate coloring that lent a particular charm to his exhibit.

The discussion was opened by Mr. W. H. Hatch, superintendent of schools at Oak Park, Ill. He was followed by Mr. E. E. Kingsley, superintendent of schools at Evanston, Ill. Mr. Hatch spoke, in substance, as follows:

CO-OPERATION BETWEEN ART AND MANUAL TRAINING.

"I have been asked to discuss this topic from the point of view of the superintendent. Instead, therefore, of attempting any full discussion of the topic, I will present three of what seem to me the most pressing needs in accomplishing the desired results:

"1. A broader view of the work by both the teacher of art and the teacher of manual training — a fuller appreciation of the relation of the two subjects. The teacher of manual training too often has but little use for the freehand blotches of the art teacher, and the latter is equally disturbed by the mechanical formalism and rigidity of the former. Each must admit that the other has something of value to contribute to the well-rounded whole. On the part of the art teacher we must hear less of art for art's sake and more of art for the child's sake. On the part of the teacher of manual training we must see less of the constructive exercise that is an end in itself and more of the making of objects that have an immediate purpose in the life of the child.

"No one will deny that one function of art instruction, and doubtless the highest is to develop in the child an appreciation of the best in art; to cultivate a love for the beautiful as produced in color or in form. Nor will we deny that in constructive work the great aim is the result to the child and that the object made is secondary. But there is a phase of art and constructive work that touches more closely the lives of all. A large part of man's constructive and decorative activity has to do with the common articles of daily life. Man has, in all his history, first made an article for use and then decorated it. Crude have been his attempts and slow has been his progress in the latter. One has only to look about him to see the great lack in the fitness of structure to use, and the barrenness and lack of artistic taste in our architecture, the furniture in our homes, mural decoration, etc. The artist produces something beautiful in itself, and the artisan an object of use to man; but how rarely do the two work together and produce an article or a structure that fills the needs of man in its use and is decorated by the artist in such manner as to satisfy the æsthetic in his nature! Structures that are in harmony with their function, and decorations that are beautiful and fit the place for which they are made, are too rare.

"The movement for fitness in form and decoration of the common articles of the

home which is so greatly forwarded by the arts and crafts societies in our cities may be, I am confident, greatly accelerated by the cordial co-operation of the departments of art and manual training in the schools of our country. The results that may be attained by the working together of the two departments are shown in some of the cities, notably the one in which this meeting is held.

"2. Both departments should more fully recognize the conscious needs of the child. He does not put much of himself into any exercise unless he has an immediate end to attain. If an article is to be made, a pressing need for its use in his little life adds greatly to the value of the exercise. The greatest teacher is he who brings the child face to face with each problem of the school life and instils him with the feeling that it must be solved. The method is of minor importance when compared with the state of mind in which the child approaches each exercise. This is more plainly seen in constructive exercises than in any other work of the school. If the child feels a strong conscious need of the object to be made, he will find some way in which to accomplish his end. The skilful and sympathetic teacher who gets near to the child and understands the needs of his little life, if he have only pencil and paper or a jack-knife and a board, will do more for him than the best-equipped shop with the best of courses. System and the well-developed courses of study whose every step must be taken in the prescribed order may be stumbling-blocks in the way. Of course, this first need of the child must not be the end. This is merely a starting-point from which the teacher is to lead the child to higher needs. The aim of teaching is not alone to satisfy the immediate need, but in meeting it to lead the child in higher and broader fields.

"3. More attention should be given to these departments by the superintendent. There is always danger that the teaching of the specialist will tend toward narrow and unrelated work. One of our psychologists has lately said that 'thinking is seeing relations.' If the relation be broad, the thought will be broad. The course of instruction in the education of the child is a broad field. In it there is no place for the work of the specialist, in the narrow sense of the term. The teacher must know the child in his relations to all other subjects to teach well in any. The fads are so called because they have been considered as bearing no relation to the other subjects in the course; and too often this has been true. Added value is given to these subjects when they are no longer considered special studies, but an essential part of the course.

"The superintendent has paid too little attention to these departments, but he cannot safely leave the direction of this work to other hands. He may neither be an artist nor have the skill of the artisan, but he should know the child and what phase of child development is to be touched by each subject. He is in a better position than any specialist can possibly be to see the needs in the course of instruction and the means to be employed in supplying these needs. It is his function to bring into harmonious relation all the forces employed in the system of schools that he directs."

When the session closed, everyone who had followed the meetings of the department during the past few years must have felt like congratulating President Richards upon having planned two sessions which established a new record for the department in respect to attendance, breadth of view, and suggestiveness.

THE EXHIBIT.

One other feature of the convention deserves at least a passing comment. The exhibit of handwork done in the Minneapolis schools deservedly attracted much

attention. It is difficult and sometimes unwise to say just what one thinks about a school exhibit, but certainly this one was admirable. It occupied the entire building of the East Side High School, and was therefore large enough to be representative; each grade occupied an entire room. The building itself was attractively decorated before the exhibit was put up, and the exhibit was not allowed to mar its beauty. In selection, mounting, and arrangement nothing more perfect could be asked for; in quality it was excellent. The color work of the primary grades was admirable, and the weaving and basketry were far superior to anything we have seen in any other city. One stood amazed at the beauty of the work of the baskets and other useful things that had been made by the children, but the secret was revealed when one stepped into the room containing only work done by teachers. We do not wonder the children in Minneapolis make fine baskets when their teachers set them such an example. Skill as well as enthusiasm is contagious. The work of these teachers was not of the routine sort, but was manifestly done by true artist-artisans who study their material, its possibilities and its limitations, with reference to both use and beauty. They were interested in their work and took time to search out or invent new weaves and more pleasing forms. Then they encouraged their pupils to go and do likewise. There are other manual-training subjects that need just such treatment at the hands of principals and grade teachers. Thus treated, these subjects would reveal possibilities no one has dreamed of.

The good influence of the arts and crafts movement was shown in some of the pieces of furniture constructed by high-school students.

The only part of the exhibit that failed to satisfy us was the work of the grammar grades, and from these grades what was shown was good; but there seemed to be lacking a sufficient amount of work that calls forth hard thinking and thorough planning and accurate doing. Both in drawing and in construction work the grammar-grade work was too near like that in the primary grades — too easy or too much a repetition of previous years' work. This is partly traceable to the newness of some of the subjects in the schools, but it is a very common fault in many city systems. Nevertheless, we are indebted to Minneapolis for a highly suggestive exhibit.— THE EDITOR.

EASTERN MANUAL TRAINING ASSOCIATION.

IN the July number we announced that Mr. William F. Vroom would contribute a report of the Allegheny meeting of the Eastern Manual Training Association. Mr. Vroom arranged with the officers of the association for a copy of the stenographic report of the discussion, expecting to use the material thus obtained in writing his report. Unfortunately the stenographer's report has been lost. The last known of it is that on the 21st of August it was left by the stenographer on the handle of the door of the Third Ward School in Allegheny and the shorthand notes destroyed.

With the help of the stenographer, Mr. Vroom was expecting to give to the MAGAZINE a better report than ever before. He says: "Could I have foreseen any such catastrophe, I would willingly have written out the whole report, as I used to do." In the absence of the report we may appreciate, more than ever before, the efficient work Mr. Vroom has done for us in past years. He sends a brief report of the business meeting, which follows.— THE EDITOR.

At the ninth annual meeting of the Eastern Manual Training Association, held at

Allegheny, Pa., July 1, 1902, officers for the ensuing year were elected, as follows: president, George H. Bryant; vice-president, E. A. Bending; secretary and treasurer, C. B. Connelley; members of executive committee, D. Upton, E. P. Chapin, and Mrs. E. S. Knapp.

Professor C. R. Richards, for the committee appointed to revise the bibliography of manual training, reported the revision completed. Copies of the revised edition were then distributed to members. A vote of thanks to the committee was unanimously carried.

Mr. Bending gave notice of a motion to amend the constitution by the insertion of a clause providing for honorary membership.

A discussion relating to the place of meeting next year brought out an expression of opinion from several members that it should be in the East. The matter was left in the hands of the Executive Committee.

After a unanimous vote of thanks to the officers of the association for their unsparing efforts for the success of the meeting, and the furtherance of the good work of the association, the meeting adjourned.

CHICAGO INDUSTRIAL ART LEAGUE.

An industrial art conference was held in Chicago, October 4, 1902, under the auspices of the Industrial Art League, an institution intended to forward the arts and crafts movement. Two sessions of the conference were held — a luncheon at the Auditorium banquet hall, followed by toasts and reports, and an open meeting in the evening at Steinway Hall, where Archbishop Ireland was the principal speaker.

Before the luncheon was served, several invited guests met at the rooms of the League, 264 Michigan avenue, where they were met by Professor Oscar L. Triggs, the secretary of the League, and Mr. E. P. Rosenthal, its manager, and a few other members. After greetings had been exchanged, they were shown through the bindery, a League workshop, which has been in operation since last May. Here they were met by Miss Gertrude Stiles, who is the master-craftsman in charge of the shop. Miss Stiles has been educated in American art schools and European binderies. Books were seen in all stages of binding, from the signatures just as they come from the printer to the finished cover of leather, tooled and inlaid in artistic form and color. To a limited extent, instruction is given in this shop on the apprenticeship plan. This is in harmony with the aim of the League, its fourfold purpose being: "(1) to provide workshops and tools for the use of guilds of artists and craftsmen, and means for the exhibition and sale of their products; (2) to give instruction in the crafts; (3) to establish industrial art libraries and museums; (4) by publications and other appropriate means to promote the arts and crafts."

On leaving the bindery the party was driven to the Jewish Manual Training School, where another of the League shops is located. Here, in a small room, was the nucleus of what is hoped will one day become an influential guild of cabinet-makers. The shop is in charge of Mr. Frederick O. Seymour, a graduate of Armour Institute. A new building has been planned to be placed on the adjoining lot. In this building it is hoped to have, in the words of Professor Triggs, "a kind of graduate manual-training school; a place where commercial products might be made, yet where training in the higher craftsmanship may be given to apprentices, and where experiments in the higher industrialism may be engaged in by masters of craft."

Another workshop of the League is located in Austin. This is for the making of furniture and is under the direction of Mr. Easton, a teacher in the Austin schools. Other guilds are forming.

At 1 o'clock members of the League and their friends gathered in the reception room of the Auditorium Hotel, where an informal reception was held, Archbishop Ireland, of St. Paul, being the guest of honor. This was followed by the luncheon in the banquet hall. The toastmaster, Mr. Frank O. Lowden, introduced Mrs. Condé Hamlin, of St. Paul, as the first speaker. She spoke of arts and crafts work in her city. Mr. Eric Pape, of Boston, was the next speaker. Then followed Mr. James Howard Kehler and Mrs. Laura McAdoo Triggs, of Chicago, Senator J. H. Stout, of Wisconsin, and Mr. Ralph Seymour, of Chicago. Mr. Kehler advocated the practical art as differentiated from the art of the studio and the parlor. "Art is high and holy when it serves the everyday purpose of men." Mrs. Triggs set forth a scheme for an art school and a guild of art workers in connection with a university. Senator Stout spoke briefly of the public schools as laying the foundation stones for industrial art in this country. He would also encourage home industries and agriculture.

After several other gentlemen had been called upon, Archbishop Ireland made a most fitting close to the discussion in an eloquent plea for appreciation of the beautiful. The following suggests the line of thought he expressed: He who fails to appreciate the beautiful remains a mere piece of matter; he has never put on the wings of the soul and soared upward. Religion, I think, can do nothing for him who lives on such a sordid plane; religion requires a fertile, prepared soil. Without the sense of the beautiful the soul is lost to the region of the purest ethics. It is the province of the priest to spread among his people the love of the beautiful. It is needed everywhere — in the homes of the poor as well as of the rich. As the beautiful in great works of painting and the masterpieces of sculpture cannot be in the homes of the poor, let it be there in the humble furniture, in the utensils, in the textiles, in the dress. See that the sunshine of beauty comes into the home of the poor. We are doing religious work if through art we lift men up and make the world happier. The beauty of this world is linked with the beauty of the next.

The evening session in Steinway Hall opened with an organ solo. Judge T. A. Moran presided. The speakers were Professor Oscar L. Triggs, of the University of Chicago, secretary of the League; Professor Robert Koehler, of the Minneapolis Art School; Professor C. F. Ansley, of the University of Iowa; and Archbishop Ireland.

Professor Triggs spoke of the democracy of art, meaning, he said, a combination of the practical and ideal so that all the people might understand and assimilate it. He said the movement is a serious social one.

Professor Koehler spoke *ex tempore* and of his own school. He said his observations were that few among the many students of art ever come to paint a picture; that most are mistaken in their calling. He declared it was a bit of philanthropy at times to keep them from becoming the "bores of relatives and friends by presenting them with hand-made portraits and other monstrosities." One of the missions of the art school he conceived to be to broaden the field of labor and to beautify it. He would encourage craft work in connection with the art school.

Archbishop Ireland gave a most inspiring address on the need of a more general and truer appreciation of the beautiful in our American life. It is expected that his address will be published in full by the League.—THE EDITOR.

BREVITIES.

"A MAN'S patent to nobility is in the fact that he is a worker."— RABBI HIRSCH.

"FOR in this world the one thing supremely worth having is the opportunity, coupled with the capacity, to do well and worthily a piece of work the doing of which is of vital consequence to the welfare of mankind."— THEODORE ROOSEVELT.

CONTEMPORARY pedagogy is growingly appreciative of the wholesomeness of work as a school means of fitting for life — whatever sets the child to work of his own motion; work with an interest; work with hand and eye and mind; work with his own purpose in view; work that fits means to ends. But it must be work that is something other than copying and mere imitation. There must be an intelligent vision behind the work, of something which he wants to do. The exercise must be one that gives fair promise of valid results of his own planning. If the product be one that he or others can use, and for which there is a need, and that is made of service after its production, so much the better. The value of the exercise consists in the reactions of the promised outcome upon the effort. The child is manufacturing or doing — playing or working for a purpose.— RICHARD G. BOONE.

SUPERINTENDENT EDWARD BROOKS has suggested to the Philadelphia board of education that the proposed down-town manual-training school should be open to students of both sexes. He says that the lack of provision for the higher education of girls in that locality is an unfair discrimination, and that, if either sex is to be favored, it should not be the boys, for they are physically able to go a longer distance to school than the girls. The new building could be so arranged as to give the boys ample opportunity for manual work, while at the same time provision could be made for the commercial and general education of the girls of the down-town section.— *School Journal.*

NEW ENGLAND.

SUPERVISOR CHARLES H. KEYES, of Hartford, Conn., an ex-president of the Department of Manual Training of the National Educational Association, has been elected president of the American Institute of Instruction for 1902–3. This is the oldest and most conservative educational association in America.

CHARLES B. HOWE, director of manual training in the Hartford High School, is spending this year in study at Cornell University. His place has been taken by William C. Holden, of Lynn, Mass. Mr. Holden is a graduate of the Maine State College. Mr. Holden's place has been filled by promoting Mr. Philip Goodrich, who has been in Lynn two years. Mr. Goodrich is a graduate of the Worcester Polytechnic Institute.

MR. HARRIS W. MOORE has also left Hartford and is now organizing manual training in the elementary schools of Watertown, Mass. His place in Hartford is taken by Mr. Stanley H. Rood, who has been teaching grammar-grade work in Worcester. He has taken with him Mr. C. C. Bryant, also of Worcester. One of the Worcester positions has been taken by Mr. Allison P. Ball, of La Salle, Ill. Mr. Ball, Mr. Rood, and Mr. Bryant are graduates of the Worcester Polytechnic Institute.

MR. LEE RUSSELL, for several years past instructor in science and manual training at the Provincial Normal School at Truro, Nova Scotia, has been appointed on the teaching staff of the State Normal School at Worcester, Mass. This must be a pleasant home-coming for Mr. Russell, for he will be with his father, Dr. E. Harlow Russell, who is principal of the Worcester school.

LUTHER W. TURNER, instructor in manual training and mechanical drawing at the Worcester Academy, Worcester, Mass., has gone to the Hill School, Pottstown, Pa., to take charge of the work in manual training in that school.

MR. M. W. MURRAY is now in charge of the manual training for boys in the grammar schools of Springfield, and he is perfecting plans for the introduction of some form of manual training into the lower grades.

MISS MARTHA HALL, formerly teaching manual training in the kindergarten for the blind at Jamaica Plain, has taken up grammar- and high-school work in the city of Taunton.

NEW YORK.

THE board of education of Auburn, N. Y., has decided to introduce manual training, and has engaged Mr. H. F. Burrage as instructor in charge. During the coming year instruction will be given to pupils of the seventh and eighth grades—woodworking for boys and domestic science for girls. Volunteer classes made up of grade teachers and students in the teacher's training school will be formed. After the work has been carried on in this manner for a year, it is expected to extend the manual training down through all the grades.

JAMES WHEAT GRANGER, originator of the Sibley college course in blacksmithing and foreman of the Cornell University foundry, died July 29, at the age of sixty-nine. Mr. Granger had given instruction in iron-working to hundreds of Cornell graduates in engineering, and was one of the best-known characters of the university instructing staff. He induced the authorities of the university to offer the course in practical blacksmithing years ago, and gave personal instructions at a single fire. Later the present large shops were built, and Mr. Granger was promoted to foreman in charge. —*School Journal.*

NEW YORK CITY.

THE Girls' Technical High School, which is being opened in New York this year, is the first of its kind to be established in that city. The four-years' course will give the pupil a choice of training in business or in some practical industry open to women, and will at the same time give every student thorough work in English, modern languages, drawing, and music. Courses will be given in applied art, printing, stenography, bookkeeping, correspondence, and allied subjects, as well as in library economics, manual training, dressmaking and the milliner's trade. Principal William McAndrew of P. S. No. 44, Brooklyn, has been elected to its principalship.

THE National Academy of Design has decided to abolish all fees for tuition in the classes of its schools at One Hundred and Ninth street and Amsterdam avenue. No fees will be required for the antique, life, painting, still-life, illustration, and composition classes.—*School Journal.*

MICHIGAN.

MR. GEORGE S. WAITE has left Grand Rapids and gone back to Kalamazoo, where conditions are more to his liking. Mr. Waite organized the work in Kalamazoo, and the growth under his supervision was rapid.

THE Grand Rapids Public Library has published a leaflet, giving a list of about 150 books and periodical articles on manual and allied subjects. No doubt many other libraries would do the same thing if attention were called to the need of it.

THE Hackley Manual Training School at Muskegon, Mich., opens this year under favorable circumstances. Among the new teachers are Mr. J. H. Hibler, instructor in first-year drawing and woodworking, and Miss Ina J. Nagle, instructor in second-year cooking. Mr. Hibler comes from Chicago, where he has been teaching for two years in the Medill and the Farren Schools; also the Chicago Normal School. Mr. Hibler received his training at Armour Institute and the Lewis Institute. Miss Nagle is a graduate of the Framingham Normal School in Massachusetts, but her home is in Denver, Colo.

INDIANAPOLIS.

MR. L. W. WAHLSTROM, supervisor of manual training, is spending a year in study at Teachers College, New York. In a recent letter he made the following statement concerning the progress of manual training in Indianapolis:

"We began to make our plans for a vacation school for colored pupils in the spring. The most difficult undertaking, that of getting a competent teacher, we were spared, for Mr. Stokes, who teaches manual training in the colored schools of the city, was planning to spend his vacation in Indianapolis, and was willing to take up the work for five weeks. The subject was brought before the attention of the school board, but, while showing great interest in the work, they were not able to give any assistance beyond granting the use of the buildings and their equipments. So we were compelled to look elsewhere for funds. Believing that it was better to help people to help themselves, we presented the matter to the Negro Civic League, an organization devoted to the interests of the colored people; and they undertook to raise the necessary funds.

"We planned to open two of the shops, which were located in the largest colored schools in the city. We also planned sewing-work for the girls and basket-work and paper-folding for the younger pupils. The city library sent one hundred books to each building for a reading-room. Three hundred and twenty-five pupils were enrolled, and the attendance remained very steady throughout the entire time of five weeks. It is hoped that the school board will take up this work in another year and make it a permanent feature.

"The evening classes, which were so popular last year, are to be continued during the coming winter. If race betterment is to come about through industrial effort, as Booker Washington says, we cannot conceive of a better way than by opening the manual-training shops in the evening to those of the men who have been deprived of these advantages in their youth.

"The manual-training work is to be extended throughout the seventh grade as far as possible this year. Two additional teachers have been engaged. Mr. Bacon is to take my place during my year's leave of absence."

CALIFORNIA.

CALIFORNIA is losing (only for the time being, it is hoped) two war horses in the cause of manual training—Mr. James E. Addicott, of the San José Normal School, and Mr. Arthur H. Chamberlain, of Throop Polytechnic Institute. Both go to Columbia University to spend the year.

MR. E. R. SNYDER has resigned the supervisorship of manual training in the Alameda public schools, to take charge of Mr. Addicott's work in San José. In turn, requisition has been made on San Francisco's efficient force for Mr. E. E. Goodell to succeed Mr. Snyder.

MR. A. L. READ, another of San Francisco's original manual-training corps, has resigned to engage in other business. The vacancies in San Francisco have been filled by Mr. M. A. Felton, from Colorado, and Mr. L. E. Davidson, of Pasadena, Calif.

MISS E. MARCIA TAYLOR, a graduate of the Sloyd Training School of Boston, is to assist in the manual-training department in Alameda.

MRS. IDA HOOD CLARK, supervisor of manual training in Nashville, Tenn., recently spent part of her vacation with friends in this state, and incidentally brought a wave of inspiration to the San Francisco school department. At a special meeting of the teachers of manual training and cooking, Mrs. Clark told us of the work being done in Nashville, giving valuable suggestions, especially as to methods for enlisting public interest in the work. A few days later she was asked by the board to address the school principals. President James Denman of the board of education called the meeting to order and introduced Mrs. Clark, who spoke on "The New Education in the South." She spoke particularly of the primary work, and aroused such interest that many of our teachers wanted to know more about it, and prevailed upon Mrs. Clark to demonstate the work. In response to a general invitation by President Denman, seventy-five or eighty teachers and principals assembled three days later to take part in the demonstration lesson.

Many of the teachers became, and continue to be, enthusiastic on the subject, with the direct result that in several schools a beginning in this work is now being made. Miss Florence Woodward, who has taken the work with Mrs. Clark, conducts classes for teachers on Monday and Thursday afternoons. The friends of manual training here feel grateful to Mrs. Clark for her presence and inspiration.— CREE T. WORK.

MR. FRANK H. BALL has resigned his position at Throop Polytechnic Institute to work for the Scranton Correspondence School. It is particularly unfortunate for Throop to lose both Mr. Ball and Mr. Chamberlain the same year.

ILLINOIS.

OWING to the difficulties in getting building material, the board of managers of the Decatur College and Industrial School of the James Millikin University has been obliged to announce a postponement of its opening for one year. This will make it possible to complete and fully equip their excellent buildings before taking in students. The four buildings now under way are the main building, including the chapel and library, the engineering building, a domestic-economy building, and a combined shop building and power plant. These are connected so that students will not have to pass outdoors in going from one to the other. Moreover, they are very pleasing architecturally.

MANUAL-TRAINING work has just begun in the Peoria High School under the direction of Mr. Presson W. Thomson, formerly of Galesburg. A room in an old grammar-school building has been fitted up with benches and lathes for woodworking.

THE marriage of Miss Bertha J. Spohr, of Bradley Polytechnic Institute, made vacant the directorship of the department of domestic science. This vacancy has been filled by Miss Gertrude Coburn. Miss Coburn is a graduate of the Kansas State

Agricultural College, and has organized departments of domestic science at the Stout Manual Training School and the Iowa College of Agriculture and Mechanic Arts. Recently she has spent a year of study and travel abroad.

CHICAGO.

THE new shop building at Armour Institute of Technology is now completed and is one of the places manual-training teachers will visit when they come to Chicago. The building occupies the northwest corner of Armour avenue and Thirty-third street, having a frontage of about ninety feet on Thirty-third street and fifty feet on Armour avenue. The building cost about $150,000, and was the gift of Mrs. P. D. Armour. The arrangement of the building is unusual. It has four stories and a basement, and each floor above the basement has a shop, a demonstration lecture-room, and a locker and washroom. The first floor is devoted to forging and pipe-fitting, the second to machine-tool work, the third to woodworking, and the fourth to foundry work. In the basement are the office, a gas laboratory, ventilating apparatus, and storage space. As would be expected, some of the shops contain heavier machines than are usually found in manual-training schools. The most novel of all the shops is the foundry with its saw-tooth roof, letting in a flood of light, and its cupola, brass furnaces, trucks, etc., all laid out on the plan of a modern industrial foundry adapted to the conditions in a large city. The power employed throughout the building is electricity.

FROM a local newspaper we learn that three years must yet elapse before the free school of manual training, to be founded in Pullman in accordance with the will of the late George M. Pullman, can be established. Although Mr. Pullman bequeathed $200,000 for the purchase of the land and $1,000,000 for maintenance, the trustees announce that it will be necessary to allow more funds to accumulate before the plans of the donor can be carried out.

MR. HENRY S. TIBBITS, principal of the Spry School, has been made chairman of a committee of the Chicago principals on manual training, which is making a serious study of the problems of manual training, with a view to formulating a course for elementary schools.

MR. FOSTER H. IRONS comes from Nashville to teach manual training and mathematics in the University Elementary School, popularly known as the Dewey School. Mr. Irons's training at Teachers College and in Chicago, his experience as a teacher and organizer, and his interest and ability in several lines of art-craft work seem to fit him in an unusual degree for work in this interesting field.

THE *Southern Workman* calls attention to the work which is being done by Mr. Charles Bartlett Dyke, who left Hampton Institute to take charge of the Kamehameha School for Boys in Honolulu. The school and the sister-school for girls were founded by Bernice Pauahi Bishop, a native princess, the last of the line of Kamehameha, who bequeathed her estate to establish and maintain schools for her people. Her husband, Hon. C. R. Bishop, has added generously to the endowment of the schools. Mr. Dyke is giving the same prominence to the trades and to agriculture that they receive at Hampton. He finds, as they do at Hampton, that the grade of intellectual work, instead of being lowered, is raised by the training of the hand. Three hours of each morning are given up to trade work by the older boys, while the younger ones receive instruction in manual training. Mr. Dyke feels that the impor-

tant thing is to create the work habit in these Hawaiian youths, for very little can be accomplished until this is gained.

THOSE who think that the idea in the "three H's" is of very recent origin should read the following book review quoted from Vol. I, No. 1, of the *American Journal of Education*, published in Boston, in January, 1826: "Hints to Parents: in two parts. Part I — On the cultivation of children. Part II — Exercises for exciting the attention and strengthening the thinking powers of children, in the spirit of Pestalozzi's method. Reprinted, Salem, 1825. 12mo, pp. 72. The idea with which this little work sets out cannot be too often repeated: 'From an early *domestic* development of HAND, HEAD, and HEART, the happiest results may be expected.' This book is a manual which may be very serviceable to mothers, if they attend properly to one suggestion of the work itself: 'It is the SPIRIT and not the *letter* of the system here recommended at which the parent should aim.'"

IN the manual-training school it is not meant that each shall be made ready for some one trade or other employment; but that each, through working at typical trades, employing common principles, shall be made resourceful in the use of mechanical forms, tools, and machines, to the end that the manufacturing and designing habit shall be fixed. In this sense the manual-training school has great responsibilities. Our people are a great manufacturing and commercial nation.—RICHARD G. BOONE.

MANUAL training is gaining ground, not only because it is practical training, but because it is the one natural method of learning. Activity of body, mind, and soul should be coexistent. The natural result of every thought is physical action, and long-continued or almost exclusive mental activity is not conducive to moral strength or to physical well-being.— *Wisconsin Journal of Education.*

VACATION SCHOOL MANUAL TRAINING.

THE vacation schools are an established fact. Newark, New York, Boston, Washington, Buffalo, and other cities make annual appropriations for their maintenance. Chicago and other cities, through temporary stringency in finances, have not yet given public funds for their support, but have such schools supported by private munificence. The service of these vacation schools to the cause of manual training and constructive work has not been well or generally known. They are today the most potent agency in popularizing these subjects or modes of study with the masses in large cities. A superficial glance over the study outlines in the various cities would suggest this sweeping conclusion; a visit to a few leading cities will confirm it. The writer left his own vacation school last summer in charge of competent assistants and visited, during the fourth week of the vacation-school term, schools in New York and Boston, supplementing his observations of a year ago in Newark, New York, and Buffalo.

A wide divergence exists between the extent to which manual training is carried in such schools as New York supports and those of Newark, Buffalo, or the Spry School in Chicago. The New York "Outline of Work and Occupations for Vacation Schools" for 1902 is one of the most thoroughly specialized plans yet carried into execution, A very large portion of the pupils in attendance were found in these industrial classes, and practically all the time of the session (forenoon only) was employed by these pupils in constructive work. Woodwork, which is quite commonly designated manual

training, was styled "benchwork" and included the making of rulers, stamp, nail, and necktie-boxes, coat-hangers, etc., to tabourettes — quite the usual lines. "Leather-work" on 4 oz. oak-tanned split consisted of repoussé work on damp pieces, making penwiper, napkin ring, card-case, dog collar, etc., to whisk-broom holder or port-folio. The steel nutpick readily lends itself as the tool in such work.

"Basketry" in rattan and raffia is the most extensive, popular, and successful in results of all the forms of industrial work in these schools, as in vacation schools elsewhere. Rattan No. 2 with No. 3 for larger skeleton framework proves most serviceable. No. 1 is excellent for the youngest pupils. Circular mats are combined into brush-broom holders, letter-cases, wall-pockets, etc., and these are followed by baskets of many forms, trays, jardinieres, and large waste-baskets forming the most ambitious projects. In raffia, hammocks, frames, boxes, and bags in variety were made. Dyeing these makes possible many pretty patterns and combinations. Diamond dyes answer in some shades, and the English Maypole dye soap yields more lasting and artistic hues. Dyeing is something of a difficult art.

"Fret-sawing" occupied a roomful in each of several schools. A soldier, horse and rider, or paper-knife led the way to wall brackets, doll furniture, fancy boxes, and card receiver. Fretsaw-work deserves a larger part in woodworking than it commonly receives.

"Metalwork." In addition to bending the Venetian iron strips, sheet-metal was manipulated even with soldering. Diminutive stands, easels, candlesticks, brackets, cups, scoops, a candelabrum, and pails were scheduled. This freedom in choosing quite rigid material is admirable.

The next class took up "exercises in knife-carving," beginning with line and leaf practice, and after exercises in design tried these designs on picture-frame, calendar or thermometer back, small bookrack, and wall-cabinet.

"Advanced sewing." In a few schools advanced pupils were able to undertake such exercises as an outfit for a bed, undergarments, dressing sacks, bath-robes, school and house dresses, and fancy doll-dressing. Of course only individual pupils accomplished any considerable number of these articles. Throughout all the industrial work this was true, individuals proceeding according to their power and diligence.

"Millinery." Pupils engaged in designing and trimming raffia hats were almost as enthusiastic as those making baskets. Much ingenuity evolved, although there was not quite the stimulus for this in the East the past season that there was in Chicago. While raffia hats were a reigning fad in Chicago, they were wholly unknown for ladies' wear in the East. It transpires that hat-trimming as well as construction is within the compass of quite young girls.

Separate classes in "embroidery, crocheting, and knitting" were engaged upon the typical examples of those arts, though often the work was much too fine for hygienic use of children's eyes.

Cooking was elaborated along the usual lines of school treatment up to the preparation of the simple luncheon of the final week. Housekeeping lessons accompanied the cooking, as also did nursing. Nursing lessons proceeded to the highly specialized topics of preparation of sick bed, care of patient, care of hair, making of poultices, compresses, and bandages; lotions, treatment of burns, scratches, and cuts; diet and general care of baby; cause and prevention of diarrhœa and constipation; use and abuse of alcohol.

My curiosity was roused by finding a room engaged upon weaving strips of old

cloth an inch wide into mats, rugs, school and handkerchief bags and bureau covers —boys they were, too. The instructor confessed to a lack of interest among his pupils.

This nearly complete enumeration of lines of industrial work in Greater New York comprises projects that, in many cases, may help a child find his bearings to confidence in his ability in some useful art. Lack of time, however, prevents that scientific method of approach of these various projects along some rational line of interest, and their development as individual achievements. There is much to be said in deprecation of such laying down of set models and precise designs to imitate.

Several classes in cardboard construction, under the guidance of Fritz Koch, an enthusiastic student of originality, were doing real inventive individual construction. When seventeen different designs follow a given problem in construction presented to a class of twenty-five pupils, there is evidence of growth and education, though, sad to relate, such work is never so popular as pure imitation.

Boston vacation schools, under the wise and sympathetic care of E. P. Sherburne, employ exercises similar to those of New York in basketry, weaving, paper and cardboard construction. Under Principal Fitzgerald the Shurtleff School in Boston gathered the largest membership among vacation schools in the United States, the Spry School in Chicago being second in number. Mr. Fitzgerald's classes were intensely enthusiastic in the construction of useful articles in the various mediums. A girl in crowded city conditions who can make articles of clothing for herself or baby sister from material furnished by the school, under charming instructors, and with like interest upon the part of her classmates, has much incentive to attend an industrial art school during the long summer days. Mr. Fitzgerald enrolled over two thousand and had upward of eleven hundred in daily attendance. He was searching for the best ways of introducing some regular school studies into his scheme.

The schools of Buffalo give much more time to branches of common-school instruction than New York city. Newark swings to the point of making number, language, etc., of superior importance in summer as in winter, and hence makes a vacation school a real summer term of school. It is over seventeen years since Superintendent Barringer started public vacation schools in Newark. He was truly the pioneer.

The writer feels strongly the conviction that the summer-term plan is the logical ideal in all city districts where the population is industrial and few children spend the summer in the country. The school life of such children is limited, and the term of six weeks is a distinct addition to the amount of education they receive, amounting, as it does, in regular attendance to forty-two added weeks of school in the eight-year elementary course. The course or method of study should be modified in summer to meet seasonal conditions and should contain an abundance of the manual expression to suit the proper discharge of increased muscular and nerve stimulation of summer. It has seemed to the writer that one-third of the time of pupils from the third to the eighth grade is quite sufficient for the manual part with two-thirds for the more intellectual portion of a summer curriculum. That much may be accomplished by one hour each morning given to the constructive work is abundantly evidenced by the exhibit of the Spry School in Chicago at its close, August 14. In this school the various forms of art dealing with rattan, raffia, cardboard, weaving, millinery, and embroidery are treated by one teacher and assistant, handling four rooms of pupils for one hour each in groups interested in the various lines. Extreme individuality, and

originality of conception and treatment result. In addition to the usual projects, original designs on burlap for table covers, tall screens, etc., were worked in large with raffia stitch; novel and striking designs for various baskets combining the possibilities of patterns, of the use of two or more materials, and of artistic methods of finishing, formed the more ambitious projects.

In the woodworking room four classes of about thirty each were given lessons of one hour in length each day, 8 to 12 o'clock. Several social projects of interest were achieved. Three long work-benches with four bench-screws each were constructed to enlarge the school equipment. A climbing ladder of ash for the school gymnasium involved considerable ingenuity and some hard, muscular exercise. The various elements of strength, tension, resistance, adaptation to form and size, to its location, and the children who should use it — all were involved in the making. A settee for a certain location in the school stairway raised questions of sort of wood, size, shape, grace with strength, etc.

Some Bradley chair designs lent an element of the odd to the unique and possibly artistic. In the construction of a library table an effort was made to secure sufficient strength with the least possible weight and minimum amount of lumber, without wholly departing from graceful lines. A small bookstand interested two or three boys, and they studied the elements of convenience in such a project and worked out a finished product, strong, compact, neat, and well finished.

Individual projects in woodwork at the Spry comprised objects of home and family use, of interest in the games and sports of the pupils, and articles needed to aid nature study and other school interests. The constructive imagination was constantly appealed to. No set models were used.

The chief effort was to graduate the difficulties in manually expressing the child's paramount interests to his abilities in imaging and executing.

There is constant progress in the plans for vacation school, and in the industrial lines they bid fair soon to outstrip the constructive outlines of the regular school year.

HENRY S. TIBBITS.

SPRY SCHOOL,
Chicago, Ill., September 10, 1902.

THE SUMMER SCHOOL OF THE SOUTH, KNOXVILLE, TENN.

"THE biggest summer school in the world." That was the verdict of President G. Stanley Hall of Clark University. Dr. Hall further said: "In numbers and interest it has never been surpassed. The character of the work being done is of the best. The greatest impression made upon me, next to the number, is the social quality of the students. You have the advantage over us in the North, by far, in the high character, socially, of the ladies especially, who are teachers in the schools. Most of our teachers are from the lower walks of life, while yours are from the best. This means more than you can probably appreciate." Dr. Hall was one of twenty-five college presidents who were at Knoxville. There were about 150 college professors, and half as many superintendents, and about 2,000 women teachers. I was very much impressed by the intelligence, refinement, and the wonderful enthusiasm of these women of the South, the summer school having drawn them from every southern state — 255 from Georgia, 170 from North Carolina, and so on, twenty-nine states being represented.

The Southern Educational Board, of which Dr. Dabney, president of the University of Tennessee, is the head, had its bureau of information there.

A fee of five dollars entitled one to all the lectures at the summer school. Board and rooms were given at the lowest possible figures, and the railroads of the South, both east and west of the Mississippi river, entered into the spirit of the occasion, and made the round trip one first-class fare. This made it possible for earnest teachers, with small salaries, to come long distances and spend the entire six weeks.

The work was so organized as to appeal to teachers of all grades and classes. Regarding the faculty, I quote our very efficient superintendent, Mr. P. P. Claxton, who says: "Among the fifty-two instructors were seven presidents of great colleges and universities, three or four ex-presidents, two or three of the best-known superintendents of city schools, and a large number of specialists, known to teachers for ability in their chosen subjects. The faculties of educational institutions in fifteen states were represented. It was a faculty of experts, and no work was left to tutors and inexperienced teachers."

A few people who came just to have a good time soon got tired and left. But the enthusiasm of the workers was so great that excursions were planned to keep them from working too hard.

It is to be hoped that this great meeting will be of some benefit to the university that did so much for its success. All the preparations for the summer school were made by the university boys, as far as the mechanical part was concerned — lighting by electricity, etc.

The Fourth of July celebration was most patriotic. The loyalty of these southern teachers to their respective states, and the eagerness displayed in listening to the reading of the principles of the "new education," as adopted by the school, was most inspiring. Under such inspiration these teachers will raise the standard of education and a change for the better will be brought about. The two subjects that will do most to effect this change are manual training and nature study.

I wish I could write of the wonderful interest in manual training shown by the teachers, superintendents, and the faculty of the summer school. Many teachers said they knew they had long needed something besides bookwork, but they did not know what that something was until it was demonstrated to them by the instruction given in manual training. A course in elementary manual training for the first six grades was given; also benchwork for the seventh and eighth grades. The course for the first six grades consisted of weaving, basketry, all kinds of raffia-work, whittling, and sewing. Lectures on the educational value of manual training were given in connection with the lessons.

At the close of the course we had an exhibition by states of the work in manual training. The walls of the chapel were decorated with rugs, baskets, hats, whips, aprons, all kinds of raffia-work, samples of patching, darning, etc., each state's exhibition draped with its own flag. Everybody on the campus was invited to inspect the exhibit, and all expressed wonder that so much had been done in so short a time.

The course was arranged so that both graded and rural schools could apply the instruction gained, and the teachers seemed to grasp very readily the idea of the value of manual training, as a related subject.

I feel that this interest displayed in manual training, on the part of all connected with the summer school, will be productive of great results. What this means to the education of the children of the South only the trained teachers of manual training can

fully realize. When manual training really gets into the course of instruction in an elementary school, it at once becomes so vital a part of the school work that every teacher of the school must have something to do with it; it becomes one of the centers of interest for teachers and pupils alike. It becomes an element of the work of the school, with which every teacher must become familiar in order to teach the other elements to the best advantage.

Perhaps nothing so impressed itself upon the teacher attending this great school as the unity of all education as presented there; teachers in primary work urging the students to take advanced courses in literature and science; professors in psychology making ardent pleas for technical education; instructors in English declaring the value of the expression of the work in the manual-training department. Yet, this "new education" of the South, with all its stress upon manual training and nature study, would by no means disparage the classics or culture studies, as these are all needed to keep education broad and rational, true and wise.

And now, in closing, I quote our president and leader, Dr. Charles W. Dabney, as to the lesson of the summer school of the South: "This is what this school has taught us: the duty of educating all the people and the necessity of diversifying our school courses. We are delighted at the interest you have taken in manual training as taught here in all its branches, in drawing and nature study, and in all the sciences pertaining to agriculture and horticulture. This has been our lesson; this is now our faith — the training of all men to do all the work for which God made them."

IDA HOOD CLARK,
Manual Training Department.

NASHVILLE (TENN.) PUBLIC SCHOOLS.

EDITORIAL.

To call the present issue of the Manual Training Magazine an applied-art number is surely fully justified by the character of its contents. And yet such a title implies a relation of the æsthetic element to the practice of manual training that is not as it should be.

That all things made in the school should be pleasing, that they should exhibit good line, proportion, and color, as well as be properly constructed and well fitted for their use, should go without saying. Indeed, it is clearly obvious that manual training lies under a heavy responsibility in this matter, for all these material creations of the hand, whether they be baskets or blankets, or articles of wood or metal, are bound to exercise an æsthetic influence whether we will or no. This influence may be good or bad, but an influence, and that a most powerful one, in developing standards of taste and judgment it must be.

It is idle to put aside this consideration of the æsthetic as unimportant and lacking in serious meaning. If art in construction meant only the plastering on of some unrelated "decoration," burned or painted or carved, to a really finished product, the whole matter might well be thrown out of question. But such superficial puttering is not art; it is the reverse ; and we cannot shirk or evade the fact that equally with the demand of the work spirit to make things useful is the demand of the play spirit to make them pleasing.

Furthermore, we must recognize the fact that it is precisely these very concrete aud simple creations that present the most effective means at the disposal of the school for developing a real and abiding appreciation of some of the most vital principles and qualities of art—the principles and qualities, indeed, that possess a chief significance in the art of a democratic people. We have here an opportunity as well as a responsibility, and it is surely not too much to say that, unless these high values can be conserved and made effective, one of the most generous and beneficent possibilities of manual-training work will be lost.

And yet anyone who is at all conversant with manual-training practice in this country knows that comparatively little has been done to realize these possibilities. A large share of the teaching in this field

is, and necessarily so, in the hands of men and women whose training has especially fitted them to deal with the more material quantities involved in constructive work — proper handling of materials, adjustment of structure, and adaptation of means to ends — rather than with the harmonies of line and color. This large fact must evidently be taken into account in any study of the general problem and in any attempt to make constructive suggestions with reference to it. Two possible lines of advance seem to stand out prominently in the situation. One of these consists in training teachers of handwork capable of dealing effectively with both elements of the problem; and unquestionably much is being done at the present time to realize this possibility. But this solution goes but part way and affects the general situation but slowly. Any large and immediate advance in practice must undoubtedly be gained through a utilization of the present resources in the field, rather than by development of new qualities in the teaching force. This would seem to mean that practical co-operation should be developed between the art teachers, so called, on the one side, and the teachers of constructive work, on the other. In this direction are undoubtedly many difficulties and many problems. Lack of sympathy as well as lack of understanding unquestionably often prevails between these two sets of instructors; but is it not fair to assume that if the first difficulty could be removed the second would soon disappear? For, after all, what are the real problems in such a co-operation but questions as to a proper and practicable division of labor? And if we take a hint from the special training through which each set of teachers has come and from the elements of the problems of constructive design, should we not come very near to a working basis, if to the constructive worker were assigned the intellectual elements relating to form and structure on the side of use, and to the other the elements reached through feeling and which relate to appearance?

Such an arrangement would perhaps not be an ideal one, but an ideal solution is clearly not possible under our present conditions, and it is decidedly a very practical set of conditions rather than a theory that concerns us. Such a division of labor in regard to manual-training work would bring the organized resources of the field into natural working relations — a result which could hardly fail to mean much to their mutual advantage and a great increase in their combined influence.

C. R. RICHARDS.

In the death of Dr. John D. Runkle, at Southwest Harbor, Me., in August last, there passed away one of the figures most closely identified with the pioneer days of manual training in this country.

For over half his life Dr. Runkle was intimately associated with the upbuilding of the Massachusetts Institute of Technology. Appointed professor of mathematics at the foundation of the Institute in 1865, acting president from 1868 to 1870, and president from 1870 to 1878, he formed one of the devoted band of great-hearted, far-seeing men whose self-sacrificing loyalty and eminent ability may fairly be said to have preserved the existence of the institution during its first twenty years of storm and stress.

During the years that Dr. Runkle held the presidency of the Institute he was responsible for many important developments in its work and policy, and among these none perhaps was of greater significance than the establishment of the mechanic-arts laboratories and a system of shopwork instruction for the engineering students. The plan of instruction adopted in the Institute laboratories was inspired by a personal visit of the president to the exhibit of the Imperial Technical School of Moscow at the Centennial Exhibition of 1876. The principles represented in the plan of shopwork there displayed were keenly appreciated by Dr. Runkle as affording a practical solution of the problem of an economical and effective system of instruction suited to the needs of engineering students. As he enthusiastically pointed out in his report to the corporation of the Institute, the pith of the plan was the separation of *instruction* from *construction*, and the analysis and presentation of the elements of a craft in type forms and operations.

In this same report was recommended the establishment of a two-years' course in practical mechanism, which shortly afterward took form in the School of Mechanic Arts. This school was of a high-school type and at first, and perhaps during its whole existence, had for its main object a practical training in shopwork methods which, together with instruction in mathematics, science, language, history, and drawing, should prepare for direct entrance to a mechanical pursuit.

It is evident, however, that as Dr. Runkle's interest in tool instruction was supplemented by observation of the work of the Institute shops, and particularly after his extended study of continental technical schools, he developed strong convictions as to the purely educational value of manual training. His views on this matter were expressed in a paper presented to the Society of Arts of the Massachusetts Institute of Technology in 1881, in a contribution made to the Report of

the Massachusetts Board of Education for 1880–81, and in a Report on Industrial Education in 1884.

In the latter report are to be found the following statements:

"Nor should we overlook the moral effect of this wider and better preparation for the active duties and pursuits of life; the effect which comes from the higher estimate and value of labor which will generally prevail when hand studies are thought worthy to rank with mental studies in our public education; from the influence on the habits, tastes, and opinions of the pupil in whose education no distinction between mental and manual studies has been made; and the effect through life upon the sentiments and character of those whose labor is ennobled by a consciousness of its dignity and made productive by a cultivated mind guiding a skilful hand.

* * * * * * * * *

"We believe that hand instruction, no matter of what kind, if adapted to the age of the pupil and properly conducted, can be made disciplinary, and a valuable adjunct to the purely literary studies.

"We believe that a hand study, requiring not more on the average than one hour per day, can be introduced into our public schools without impairing the educational value of the studies now taught, and with no abridgment of the time now devoted to them which will not come through better methods of teaching, or on other grounds.

"We believe that a workshop, as part of the apparatus of a public school, is as desirable as a science laboratory is to the technical school or college.

"It is the deliberate opinion of this association that the time has come when handwork should be taught to the proper extent in all our public schools, both because of its educational value, and because the social and industrial conditions have so changed as to make such teaching necessary."

To the establishment of the Moscow plan of shopwork instruction in the engineering courses of the Massachusetts Institute of Technology, and later in the School of Mechanic Arts, is largely due the influence and spread of the so-called Russian system of manual training, so admirably adapted to the needs of engineering-school students, and so questionably fitted for the needs of younger students.

It is not, however, with any scheme of instruction that Dr. Runkle should be identified in the history of manual training in America. It is his able, enthusiastic, and influential advocacy of the educational value of tool-work, when such ideas had few supporters and many oppo-

nents, that should cause his name to be held in grateful remembrance in these present days as one of those who planted where we reap.

C. R. Richards.

Very few, if any, of those present at the Minneapolis meeting of the National Educational Association realized that their president, Dr. William M. Beardshear, had been stricken with a fatal disease. They knew that he was reported as being ill and unable to deliver his presidential address, but they knew that he was in the city and every day looked to see him in his place upon the platform. Though he did not appear, no alarm was felt. It was therefore a surprise to learn of his death in Des Moines on the fifth of August. His death has seemed to cast a shadow over the bright memory of that meeting, though the shadow is softened when we remember his happy comradeship and genuine manliness. Dr. Beardshear had marked literary ability and great executive power. For the past eleven years he has been president of the Iowa State College of Agriculture and Mechanic Arts, and during that time has led the advancement of practical education in Iowa. He was born in Dayton, O., in 1850, and entered the army of the Cumberland at the age of fourteen. He received the degrees of A.B. and A.M. at the Otterbein University of Ohio, and spent two years of post-graduate work at Yale. He was a warm friend of manual training and several years ago served as president of the Manual Training Department of the National Educational Association.

Three important movements in the manual-training field have forced themselves upon our attention during the past three months. The first of these is the rapid increase in the number of vacation schools and the large place that manual-training and applied-art work are taking in these schools. This new development, and several problems that may grow out of it, are considered in the article by Mr. Tibbits which we publish in this issue. The second movement is the great awakening in the southern states which is set forth in the article by Mrs. Clark. What this will mean for the educational methods as well as the industrial development of the South only those who have introduced manual training under similar conditions can realize. The third movement is the steady and intelligent introduction of manual training in the Northwest. In January, 1901, we called attention to an apparently sudden movement in Michigan; now it is in Wisconsin, and especially in Minnesota.

Manual training began in the public schools of Minnesota in January, 1887, when classes in woodworking were opened in the Minneapolis High School under the instruction of Mr. W. F. Decker. In October of the same year work was begun in the St. Paul High School which almost immediately developed into what is now known as the Mechanic Arts High School. A few years later the Duluth High School followed the example of the Twin Cities. Work was begun in Stillwater also. The development was rapid until the financial stringency of 1893. From that time until about two years ago very little progress was made. Meanwhile, however, the manual-training idea was getting hold of the people, and now that financial conditions are more favorable a marked development is taking place. In Minneapolis Mr. Painter now has nine assistants in the four high schools of the city, and several lines of constructive work, notably weaving and basketry, flourish in the elementary schools without the employment of special teachers to care for them. In St. Paul a new department has been opened recently in the Central High School, and there is hope of extending the work to the other high schools and in some form to the lower grades. This is in addition to the work at the Mechanic Arts High School under Principal George Weitbrecht. The work began in Anoka nine months ago with a gift of $1,000 from a wealthy citizen. The work now consists of woodworking, mechanical drawing, wood-carving, and drafting garments in the high school, and sloyd and sewing in the sixth, seventh, and eighth grades. In the lower grades there is work in basketry, mat-weaving, and paper construction. The equipment is very simple and the expenses are kept to the lowest point, but the superintendent writes: "The six months' experience makes us all enthusiasts." Only one special teacher is employed, one of the grade teachers being released at certain hours to teach the sewing. Faribault began woodworking in the high school a year ago. The department has just moved into new, roomy quarters with power equipment for wood-turning and sawing. It is expected that additions will be made to the equipment until it is complete enough for a full four-years' course. Mankato has appropriated $1,500 to begin the work this year. Equipments for benchwork in wood and mechanical drawing have been purchased. Forty-eight boys, mostly first-year high-school, are at work, and already the spirit of the school has been changed for the better owing to this new work. Superintendent Uline writes that "interest in the matter is widespread in the community, and the prospect for development is exceptionally good both in the high school and

the grades." Winona has made a beginning by placing in one school building an equipment for eighteen pupils. Up to the present time the instruction has been limited to the pupils of the ungraded school in that building and has been in charge of the teacher of that school, but the superintendent hopes that in the near future the work may be extended to all the schools in the city. Park Rapids began last year with equipment for twenty-five pupils. The work was made optional in the grammar and high schools. This year the work is being extended down as low as the fifth grade. A feature of the work here is the requiring of pupils to furnish "most of the common tools" that they need to use. Moorehead has basketry work. The board of education pays for instruction given to the teachers, and then the teachers give instruction to their pupils once a week in grades from one to eight. The town of Staples has also begun work in manual training. No doubt there are other towns of which we have not heard. To these should be added also the normal schools, at least two of which employ special teachers of manual training.

REVIEWS.

Contributions to Education. Published by The University of Chicago Press, Chicago, Ill. 5⅛ × 7⅜ in.; paper covers.—No. 1, *Isolation in the School*, by Ella Flagg Young; price, $0.50. No. 2, *Psychology and Social Practice*, by John Dewey; price, $0.25. No. 3, *The Educational Situation*, by John Dewey; price, $0.50. No. 4, *Ethics in the School*, by Ella Flagg Young; price, $0.25. No. 5, *The Child and the Curriculum*, by John Dewey; price, $0.25. No. 6, *Types of Modern Educational Theory*, by Ella Flagg Young; price, $0.25.—This series might well be entitled "Contributions to the Education of Democracy." It offers material much needed by students and workers in education both inside and outside the school, and recognizes that all other questions rest upon those of organization and administration, dealing with these in a manner which will aid many to appreciate their relations to large psychological and social problems, even when their own work is in a narrow field.

Isolation in the School consists of three sections: (1) the parts of this social institution; (2) some recent constructions of psychological, ethical, and logical modes that must be recognized in a rational conduct of the school; (3) the function of a school in a democracy. The introduction discusses the current biological analogy, the school an organism, and shows the fallacy that arises from a failure to recognize that this does not "consider the necessity for transfer of function" in the school which is not an "inflexible organism." Parts I and III ought to be read and worked upon by all program-makers for teachers' meetings, institutes, and conventions, until we all learn better the democratic principles upon which modern society stands and which alone unify the questions at issue. Part II is especially valuable in its treatment of the philosophical content of education. Psychology is taken as the core, and the material is organized about the topics, habit, and attention. A careful examination is made of the positions of James and Baldwin. The logical and ethical aspects are suggestive of what needs emphasis in texts for teachers.

The average student of Professor Dewey must keep in mind a considerable number of journals in order to keep up with his latest word. It is fortunate that his address, as president of the American Psychological Association, New Haven, 1899, is now brought to the attention of teachers in No. 2 of this series, *Psychology and Social Practice*. It is withal the best statement that we have found of the relation of psychology to education, and brings out clearly the truth that was contained in Münsterberg's widely read chapters on this subject, and at the same time opens up other aspects of the problem in a way that is thoroughly helpful. A real basis is given for the claim made that teaching is a profession, and suggestions are made for more effective work in the psychological laboratory. A great service will be rendered when Dr. Dewey states more definitely the function of the school as a laboratory, and his own school or some other school has the funds to employ a psychologist to work among the children, having his main interest in psychological problems.

Three papers read before various associations are brought together in *The Educational Situation*. These deal with the elementary education, secondary education, and

the college. Read together they are even more significant than they seemed when they first appeared. They furnish a good answer to the many critics who pass adversely upon present educational tendencies.

Ethics in the School aims to assist teachers who "find themselves sometimes troubled and discouraged because of their inability to discover those causes which are active in many trying cases that arise in school discipline." One of the best sections furnishes a suggestive reply to the frequent justification of emulation between children. The extreme of the new education is noted. "In the revolt of Czarism in parents and teachers it is a fatal mistake to let the child set himself up as a Czar; because in that case the wand of unbridled authority has merely changed hands. It is dangerous to seize upon new half-truths and substitute them for old half-truths."

Some Types of Modern Educational Theory gives Professor Young's estimate of the systems of (1) Arnold Tompkins; (2) Mary R. Alling-Aber; (3) W. W. Speer; (4) Francis W. Parker; and (5) John Dewey. The last named is the most sympathetic and the most valuable. We need more handbooks of this type which bring together the results of comparative studies made by a clear thinker.

The last of the series to appear, but the fifth in announcement, is perhaps the most valuable of all. The change in the title from that announced — *Psychological Aspects of the School Curriculum* to *The Child and the Curriculum* — is significant of Professor Dewey's tendency to simplify wherever possible. The two terms are taken as the foci which control the situation, and a clear case is made out and dispassionately discussed — the issue between the old and the new education. The merits and the defects of each are definitely shown.

To the student who reads the literature that has appeared in recent years on education, there often comes a feeling of dismay at the chaotic conditions that seem to prevail. To such a one this series will prove to be a welcome help toward unity.— FRANK A. MANNY.

Constructive Form Work. An Introduction to Geometry for the Grammar Grades. By William N. Hailmann. C. C. Birchard & Co., Boston. $5\frac{1}{2} \times 8$ in.; pp. 60. —The author states that the purpose of the book is to develop clear geometrical notions, to give skill in accurate construction, to cultivate a healthy æsthetic feeling, the power of visualizing creatively in geometrical design, and thus, incidentally, to stimulate genuine vital interest in the study of geometry. This statement tells briefly the aim of the book. The teacher should study the method employed to bring about this aim and work with the method rather than with the book as a fixed set of problems.

It should give great gratification to the manual-training teacher to have one of the leaders in modern educational methods use design and constructive work to vitalize geometry. While the book is primarily for the teacher of geometry, the method employed is well worth the study of the teacher of design or manual training. —F. H. IRONS.

How to Make Baskets. By Mary White. Doubleday, Page & Co., New York, 1902. $5 \times 7\frac{1}{2}$ in.; pp. 194; price $1, *net.*—This book contains the following chapters: (1) "Materials, Tools, Preparation, Weaving;" (2) "Raffia and Some of its Uses;" (3) "Mats and Their Borders;" (4) "The Simplest Baskets;" (5) "Covers of Baskets;" (6) "Handles of Baskets;" (7) "Work Baskets;" (8) "Candy Baskets;" (9) "Scrap Baskets;" (10) "Birds' Nests;" (11) "Oval Baskets;" (12) "Finishing;" (13) "How to

Cane Chairs;" (14) "Some Indian Stitches;" (15) "What the Basket Means to the Indian." The book contains nineteen full-page half-tone illustrations from photographs of baskets, and forty-seven etchings from pen-drawings. It is well arranged, printed on good paper, and well bound in canvas-covered boards. The working directions are clear. The chapter on "Indian Stitches" is suggestive, and the one on "Finishing" contains valuable directions for coloring with vegetable dyes. The book is especially strong in directions for making rattan baskets, and its principal weakness lies in the fact that it gives comparatively little attention to raffia baskets. This is compensated for only in part by the chapter on "Indian Stitches." On the whole, however, as a book for teachers, it is the best book on the subject that has been published.

Papers Delivered before the New England Association of Teachers of Metal Work, 1898–1901. By F. E. Mathewson, secretary, Mechanic Arts High School, Springfield, Mass. Published by the association. 6 × 9 in.; pp. 56; price, $0.25.—This association is doing a great service to manual training by publishing this volume and selling it at so low a price. No teacher of metalworking should be without it. Besides discussions of various phases of manual training by Dr. T. C. Mendenhall, Principal Charles F. Warner, William C. Holden, B. A. Lenfest, Frederick H. Cranston, and others, it contains valuable papers on details of shopwork; for example: "The Cutting Action and Setting of Tools," by Frederick W. Turner; "The Flat Drill — A Demonstration Lesson," by Allan K. Sweet; "Forge-Shop Equipment," by Edward P. Hutchinson; "Styles and Sizes of Machine Tools," by Allan K. Sweet; "Hardening and Tempering Steel," by Edward R. Markham; "Note Books and Accessories," by C. Abbott Davis; "Art in the Forge Shop," by Frank E. Mathewson.

The following have been received:

Hand-Loom Weaving. By Mattie Phipps Todd. Published by Rand, McNally & Co., Chicago, 1902. 5 × 7 in.; pp. 160; price, $0.90.

Training in Wood-Work. By James M. Tate. Published by School Education Company, Minneapolis, 1902. 5½ × 7¾ in.; pp. 120; price, $0.85.

Metallic Implements of the New York Indians. By William M. Beauchamp. Published by the University of the State of New York, Albany, 1902. 5¾ × 9 in.; pp. 92 + 37 plates; price, $0.25.

Horn and Bone Implements of the New York Indians. By William M. Beauchamp. Published by the University of the State of New York, 1902. 5¾ × 9 in.; pp. 100 + 43 plates; price, $0.30.

The Story of the Art of Building. By P. L. Waterhouse. D. Appleton & Co., New York, 1901. 4 × 6 in.; pp. 213; price, $0.35, *net.*

Report of Wisconsin Manual Training Commission. By L. D. Harvey, state superintendent of public instruction, Madison, Wis. Printed by the state, 1901. 6 × 9 in.; pp. 83.

Instruction in Agriculture and Domestic Economy in Rural Communities in Wisconsin. By L. D. Harvey, state superintendent of public instruction, Madison, Wis. Printed by the state, 1900. 5¾ × 8¾ in.; pp. 36.

VOLUME IV NUMBER 2

MANUAL TRAINING MAGAZINE

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THE DEVELOPMENT AND PRESENT STATUS OF MANUAL TRAINING FOR BOYS IN GERMANY.

DR. PABST,
Director of the Lehrerseminar für Knabenhandarbeit, Leipzig.[1]

THAT the training of the hand is one of the tasks of education was acknowledged by theorists of pedagogy in Germany, as well as in other countries, centuries ago, and to a certain degree has been carried into practice. It is worthy of mention that even more than a hundred years ago in the schools of the well-known "Frankischen Stiftungen in Halle"[2] some kind of manual work was carried on; also that the "Philanthropists" cultivated manual training in their institutions. Pestalozzi, Froebel, Herbart, and others have confirmed its importance theoretically, and have acknowledged its value by putting theory into practice. However, not until the second half of the nineteenth century had these efforts made great advancement. Incited through the inspiring thoughts of an essay by Professor Biedermann, of Leipzig, *Die Erziehung zur Arbeit, eine Forderung des Lebens an die Schule*,[3] there arose in Germany a stronger movement for instruction in handicraft, which was supported by the agitative activity of the former *Rittmeister*[4] von Clauson-Kaas, of Copenhagen. An organization of these endeavors took place in the year 1886 in the establishment of the "Deutscher Verein für Knabenhandarbeit,"[5] which, under the leadership of the parliamentarian von Schenkendorf, soon became supporter of the movement. In 1887, established

[1] Translated by ERNST RUDOLPH BRESLICH, Bradley Polytechnic Institute, Peoria, Ill.

[2] Establishments of Franke in Halle.

[3] "Training to Work, a Demand of Life upon the School."

[4] Captain of cavalry. [5] German Society for Manual Work for Boys.

by this society, there came into life a school for the training of teachers to give instruction in manual training, which until 1898 was under the direction of Dr. Goetze, of Leipzig, to whom enough credit cannot be given, and which since his death has been taken charge of by the writer of this article.

Since 1896 this institution has owned a suitable building, in which teachers, especially during the summer vacation, are trained. The number of teachers that have been graduated from the institution up to the present time is far above 1,000. Many foreigners also, especially Englishmen, have attended the institution.

At the beginning of each year a special program giving the courses of instruction is published, and at the close of the year a report summing up the chief results.

The courses of instruction offered are: woodworking, including benchwork and carving, pasteboard work, metalwork, and modeling. The "Deutscher Verein für Knabenhandarbeit," which, with the aid of several states, supports the Leipzig institution, also publishes its own magazine, *Die Blätter für Knabenhandarbeit.* This appears monthly in Leipzig, and contains articles of theoretical content as well as results and experiences of instruction, news concerning the progress of manual training in Germany and abroad, courses, new models, etc. The number of the members of this society is 2,000.

Regarding the inner development of the instruction in handicraft for boys in Germany, it can be said that at the present time the educational manual training forms the essential part and gives it its characteristic peculiarity. The tendency which often showed itself at the beginning of the movement, and even in the seventh and eighth decades of the last century, to teach handicraft as a direct preparation for some trade, or to try to revive certain industries, has been overcome entirely in the last ten years, so that at the present time nearly all schools of handicraft in Germany have purely educational aims. Yet it is true that the great majority of them still stand outside of real school instruction; only in proportionately few schools, of which we shall speak later on, has manual training been introduced as an organic constituent part. The majority of schools carry on manual training as an elective course during the time in which no other instruction is given. The *Volksschulen*,[1] in particular, take interest in this cause; but a number of *Gymnasia*, *Realschulen*, and especially training schools for teachers give their students an opportunity to take manual training.

[1] Public schools.

In general, provinces rich in industries are in the lead: Westphalia and the Rhineland, Upper Silesia and the kingdom of Saxony, Baden and Hesse, in south Germany, etc.; in provinces which are principally agricultural our teaching generally stands in the background, with the exception of the province of Schleswig-Holstein, where many simple village schools carry on a splendid work in manual training suited to the local needs. Also the dukedom of Anhalt, for instance, provides for it in a remarkable degree. Even in the year 1888 the writer of this article, in his former position as teacher at the Teachers' Training School in Goethen, was able to organize instruction in handicraft, and at the present time at that institution it has gained such an extension that it is carried on systematically in the six classes of the training school as well as in the four classes of the practice school connected with the training school.

In the *Schüler-Werkstädten*,[1] as the voluntary manual-training schools are generally called, different courses are offered, according to the local circumstances; in some places more woodwork, in others pasteboard work, or some other branch. The choice is often determined by the means at hand, the smallness of which often compels the choice of the courses which involve the least expense, or by local industries that wish to draw the interest of the boys to a certain kind of work, as, for instance, the extensive iron industries of Westphalia. In general, courses in pasteboard work, carving, and benchwork in wood are the most widespread.

Just as we find a great difference in the kind of courses, so we find a difference in the number of classes and number of pupils in a class. In general there are from twelve to twenty scholars in one section. The dominant method of instruction is the one inaugurated principally through Dr. Goetze at the Leipzig training school, known as the "Leipzig method." Since the majority of teachers had their training in Leipzig, or according to the Leipzig plan, this method has spread over all Germany, and, besides, has become established through various writings and courses, the most important of which are those in benchwork, carving, and metalwork, published by Dr. Goetze. These still may be regarded as authoritative.

Besides the Leipzig method, which regards manual training as an aim in itself and carries it on independently of other courses of the school, other methods have been developed which either make manual training supplementary to the other courses, or bring it into organic

[1] Student workshops.

connection with one or other of the courses (as drawing, geometry of space, the object method). As representatives of this tendency may be named the schoolmasters Kumpa in Darmstadt, Scherer in Worms (Hesse), Springer in Silesia, Hertel in Zwickau (Saxony), and Brueckmann in Königsberg (Prussia); in their schools manual training has been introduced partly as a compulsory course.

The German teachers on the whole take widely different positions with respect to the teaching of manual training. A great many of them are entirely passive for one reason or another, while others from the beginning have shown themselves violently opposed to it. This opposition is directed partly against manual training itself, which is strangely looked upon as a purely industrial occupation, and to which every right is denied to be brought into any connection with the school; partly the opponents turn against some particular form of manual training merely or against the compulsory pursuit of it in the school. The opinion of the opponents found its most decided expression at the German Teachers' Convention at Cologne in the year 1900, which expressed itself in a rough manner against any connection of manual training with the school. Yet it is to be noticed that even in this assembly there existed a very strong minority, consisting especially of the younger teachers, which did not at all approve the resolutions passed by the majority. This is also the opinion of the pedagogical press, which has expressed itself in such a manner as to leave no chance for ambiguity. There is no doubt at all that a considerable part of the German teaching force has a lively sympathy for manual training, and frequently it is only the external conditions that check a strong and rapid development. The inner growth, in consequence of this violent opposition, has been helped even, rather than injured. The friends of manual training have therefore really no reason to be dissatisfied with the present development, and may hope that the sound ideas which are at the base of manual-training work not only will gain a final victory, but will influence greatly all instruction and the system of education generally.

FACT AND FANCY IN MANUAL TRAINING.

ARTHUR HENRY CHAMBERLAIN,
Throop Polytechnic Institute, Pasadena, California.

"Who lives to nature, rarely can be poor;
Who lives to fancy, never can be rich."

WHEN some months ago I was asked by the editor of the MAGAZINE to contribute an article upon cardboard construction in the school, I hesitated. The MAGAZINE is read by many not actually engaged in the teaching of manual training, but who are really looking for something that can be used with profit. One can ill afford, therefore, to be dogmatic in statement. With this thought in mind I have determined to precede the article upon cardboard work by the present paper, in order that I may state the general existing conditions as I understand them.

Many advocates of manual training today are beginning to speak with that assurance which is, I fear, born of superficial knowledge. The writer feels every time he puts pen to paper, the danger of making statements that cannot be borne out by educational experience. He also feels that the line of least resistance is frequently in the direction of ignoring such experience.

As, from time to time, one talks with educational experts or reads the literature of today, he must be impressed with the extravagant claims made for manual training. The supervisors and teachers of such work are usually the ones to make the most sweeping assertions as to what results may be expected when manual training has been given a hearing in the school. Each teacher has a different list of mental, bodily, and spiritual virtues that will be the portion of the child fortunate enough to come within the pale of manual instruction. Upon what are these statements based? Are they mere conjectures? Is there a re-echo of the utterances of some of the wise ones whose judgments we accept blindly? Are certain attributes and "powers" of the mind actually being developed and expanded, which under linguistic treatment would remain "without form and void"?

A prominent western school man said to me recently: "Tell me some one point upon which all manual-training teachers agree." My reply was a request that he mention a point upon which all teachers of

history take a common ground. What should the manual-training teacher hope to accomplish? The same kind of results, within limits, that the teacher of history should hope to bring about. What the content of this result is to be, may not be discussed at this time. It is being expressed by a variety of men in a variety of ways. For our present purpose it may be stated as a preparation for more complete living, or maybe, *per se*, a more complete living.

It is then, to my mind, rather an exaggeration to say that manual training will reform the school; will clear up the program; will make the work of the teacher a continuous joy and pleasure, and will produce pupils happy, strong, honest, careful, attentive, self respecting, considerate of others, orderly, etc., etc., *ad infinitum*. Any school subject, properly presented, should assist in one or another of these directions. Manual training, if rationally considered, should perhaps do more than any other one subject toward bringing about ideal conditions and the proper balance of results. As now generally taught, it is falling far short of the claims being made for it.

If handwork is to be the *sine qua non* in education, it must have a different handling than at present. In fancy, we have nearly completed the handwork serial; in point of fact, the first chapter is but begun.

Of the many problems confronting us in our study of the manual-training situation today, there are two principal points upon which I desire to touch in this paper. These problems are so manifold in their various aspects and grow out of such a many-phased social and industrial condition, that I can give the most meager suggestion only as to their import. Let us consider, then: first, the vocational as conforming to the educational thought in manual training, and second, "the course of study" idea.

Our first problem, then, is the trade *vs.* the culture side of handwork. It is one of much importance and deserving of careful consideration. One of the most vital mistakes of today is made in erecting a wall between the vocational and educational phases of our subject; distinguishing sharply between the thing utilitarian and the thing culture-bearing. Manual training in the school should be educational. The teaching of a trade must be left until such time as the pupil has a knowledge and experience to enable him to choose wisely and well his calling, trade, or vocation. The utility idea must not be divorced, however, from the educational thought. The world has advanced upon lines of a broad, rational utility. That handwork which, while

striving to develop the boy upon a firm foundation, does not take into account, in any degree, his particular likes, aptitudes, and abilities, is not of the true educational stamp. The boy who would make a good carpenter or tinsmith may under careless, faulty, or narrow teaching be led to become a second-rate minister or an indifferent shipping clerk.

It must not be understood here that I am in any sense advocating trade instruction in the grammar or high schools. It is a question of what is educational and culture-producing, and will tend toward that fulness of living that is so essential. As a people we are becoming greater producers. Competition is keener than ever before. The arts are more varied; specialization is being carried farther; machinery, invention, improvement is the order of the day. With these improvements in the mechanical, the objective world, come increased opportunities for more complete living and a demand for better social conditions. In the truest sense the individual who does the best for himself, will be of the greatest and most lasting benefit to those with whom he comes in contact. It is the personality of the individual, of the units in the community, which constitutes the tone of the community. In speaking of the stages of growth in the individual, Professor John Dewey says :

> The first stage (found in the child say of from four to eight years of age) is characterized by directness of social and personal interests and by directness and promptness of relationship between impressions, ideas, and action. . . . . In the second period, extending from eight or nine to eleven or twelve, the aim is to recognize and respond to the change which comes into the child from his growing sense of the possibility of more permanent and objective results, and of the necessity for the control of agencies for the skill necessary to reach these results. . . . . The third period of elementary education is upon the border land of secondary. It comes when the child has a sufficient acquaintance of a fairly direct sort with various forms of reality and modes of activity; and when he has sufficiently mastered the methods, the tools of thought, inquiry, and activity, appropriate to various phases of experience to be able profitably to specialize upon distinctive studies and arts for technical and intellectual aims.[1]

I have repeated myself in these statements that the matter may be clearly before us. My point is that the educational or culture view may be such a narrow one as to exclude a vast amount of instruction, that would tend to render the individual more efficient in the vocation he may choose to follow and at the same time more useful to the com-

[1] *Elementary School Record*, No. 9.

munity. The public school should give to those boys and girls who never go beyond the elementary or high-school stage, the opportunities that are theirs by right. It is such as these who need instruction that is related to life.

It will be seen then, that in using the term "vocational," I have in mind the industrial life in its broadest or educational meaning.

Our second point, the course of study, is a question of all-absorbing interest to teachers of manual training and to those professors of education and pedagogy who are making a study of the expressive side of child nature. The what-to-do phase of the subject seems to be championed by two general and distinct lines of thought. On the one hand, the courses of study are rigid, set, unyielding from year to year. The exercises or models in whatever material — wood, iron, cardboard, etc. — have little or nothing in common with other lines of school work, nor do they appeal to the boy as being of a useful nature, either at the home, in the school, or on the play-ground. Perhaps the scheme of work is defended from the standpoint of "tool sequence," whatever that may mean, or because the subject may lose its dignity (?) if presented in other than an isolated manner. In all such courses the execution of the work may be good, but artistic feeling, sense of freedom, ideas of growth and development, are largely lacking. Certainly there is very little of the co-ordinate thought or of individual initiative brought in.

What, then, can be said of the other idea so prevalent in the teaching of the manual subjects? How does it differ from the "cut-and-dried" side of the question? Does it aim at rationality in thought, in manipulation, in the character of the models produced, or in satisfying the life-interests of the pupil? Those who work from this side are many of them, through policy or from choice or ignorance, disregarding all established principles. The methods used in manual-training instruction would be thought entirely out of place if applied to literature or the physical sciences. "Correlation," "self-expression," "development from within," "individual initiative" — these terms are juggled with the utmost ease and thrown out of their proper perspective. The lesson which should have been wisely thought out and presented to minds that were being carefully directed, is by some legerdemain turned into a free for all game of chance. The odds are in favor of the pupil choosing to construct some object, article, or machine that he can do in a partial or halfway manner at best.

The question of the growth of motor ability in children is of broader reference than merely to the drawing, cutting, pasting, sewing, and modeling in manual-training courses. It bears equally upon early work in reading, enunciation, and writing. Just as the fitness of topics and treatment in mathematics, history, geography, and other sciences is conditioned by the mental capacities of children, so the fitness of all work involving movements is conditioned by the powers of motor co-ordination and control.[1]

But, you say, if the pupil is satisfied and the work meets his demands, he is gaining strength thereby. Are these conditions realized, however ? Occasionally, yes, but under the eye of experience and experiment, this idea is many times dissolved into fancy. Fact shows that too often the pupil tires of the thing he has undertaken to make. He notes its too crude appearance. He realizes his ideas do not grow into form and beauty as do those of his fellows. His production does not meet the requirements laid down for it, as he had expected — does not fulfil its intended function. Disgusted and disheartened after some weeks of work, he declares he cares not for his tools or workbench, and he will gladly retire to the side street for a game of dice and a cigarette.

The illustration, you insist, is overdrawn ; that in reality the boy is guided, and he progresses and develops in his work, the manual processes really laying a helping hand upon all the work of the school, producing real, vital results. There are schools where an approach to the latter condition exists.

As an indication of what it is sometimes presumed young pupils can do, let me quote the list of objects given for manual-training work in one school under the heading "Knifework for Seventh and Eighth Grades :"

Book, ink bottle, saw — carpenter's and wood saw, ax, hatchet, hammer, mallet, vise, gun, sword, cannon and carriage, saw-horse, carpenter's plane, school pointer, yardstick. Set of square-root and cube-root blocks, wood-link chain, ball in tower, croquet set — balls, mallets, arches, and posts — crochet and tatting shuttle, block and tackle, a system of pulleys, tennis racket, table, chair, rocker, school desk, school house, top. Picture frame with vine carved on sides — oak leaves carved and placed on corners ; also other frames in other forms and carvings. Wagon, cart, railroad engine and cars — a train, wheelbarrow, grocer's two-wheeled cart. Set of parlor furniture, set of bedroom furniture. Boats — canoe, skiff, scow, schooner, sloop, brig, frigate, yacht, man-of-war. Houses of different styles of architecture.

[1] PROFESSOR E. L. THORNDYKE, "Notes on Child Study," *Columbia University Contributions to Philosophy, Psychology and Education*, Vol. 8, Nos. 3–4, p. 99.

Then note what follows in the suggestions for above work : "Large objects can be made with plane, saw, hammer, etc." Why not include under the head of mathematics in these grades : calculus, plane and spherical trigonometry, mechanics, theoretical and applied, differential equations, and something of the history of mathematics ?

In one of several experiments tried along the line of individual initiative (and almost without exception the term "extreme" explains the degree to which this phase of teaching is carried, if attempted at all), three pupils of from nine to eleven years of age used in three weeks more material of all kinds than was used in four weeks by some dozen adults and half as many children combined, producing results so unsatisfactory to themselves that much tact had to be displayed to put them once more into happy and contented frames of mind.

I do not mean to imply that cost or waste are the main features to be kept in mind. Expense, however, is a matter of much importance, especially in a large and unwieldy system. Besides, one of the great lessons the child should learn is that of conserving material and of using that which he has at hand. The economic and ethical phases are demanded by the community. More than all, the boy, in the last analysis, enjoys himself most and makes the best progress when he feels himself under the proper lines of guidance. He will the sooner, for this method of treatment, work out his own salvation and grow into the best self-helpfulness.

I understand fully the danger and folly of suggesting a change in method without at the same time offering a substitute. Is there not a medial ground between the two extremes I have outlined ? In all ages, whether in religion, politics, art, or letters, the swing has been first to the one side and back to the other, to rest finally upon a middle ground of calm, rational common-sense thought and practice. So I think in manual training, as an outgrowth of the conservative thought upon the one hand and the radical upon the other, will be evolved and is being evolved a thought which we should strongly consider.

We need have no fear of detracting from the dignity of the subject itself by taking it out of its narrow limits and throwing it forward in co-ordination with the other subjects of the curriculum. Teachers must, however, bear in mind that a correlation which does not correlate is useless. Neither should handwork be used as the medium of illustration in any traditional subject only as the article to be made in the shop or at the desk can be well and carefully made by the pupils in question and just as readily understood as can the subject, lesson,

or experiment to be illustrated. In short, the ability of the pupil should be considered from the standpoint of construction as well as from the view-point of the subject matter of the lesson.

The reader who has not carefully followed the argument I have attempted to make may conclude that after all I am advocating a course of study made by the teacher, with the pupil and the community left out. Again, the reader unacquainted with the methods in handwork as practiced throughout the country may think I am outlining a situation that does not exist and that there is little danger, at present, in our attempts to get away from the formal side.

To the first I would suggest a second reading of the article, and to the second a thoughtful study, at first hand, of the actual practice in our various schools.

Accuracy, sequence, or system, as the terms are so frequently understood, should not be put forward as essentials when framing our lines of action. We must, however, suggest, or lead, or allow, the pupil to suggest for construction that which he can in some degree accomplish ; and must for the sake of the child and his future welfare lead him to think clearly, to do and to live nobly.

THE CORRELATION OF MANUAL TRAINING AND PHYSICS.[1]

CHARLES B. HOWE,
Ithaca, N. Y.

LET me say at the outset that this paper is presented from the manual-training standpoint, and has been prepared with a view of collating sufficient data to indicate in a fair measure to what extent attempts have been made toward correlation and how far it is feasible. The central purpose has been to investigate that part of the subject which is concerned mainly with the making of apparatus.

In response to several inquiries for information bearing on the subject, I received replies sufficient in quantity and variety to warrant the assumption that they are evidential of the general feeling among manual-training men. I will quote from the replies which I received in so far as they get at the root of the discussion.

In the first place, as to what has actually been done, it is evident that there are three distinct phases of the subject, and we shall need to make the following classification: first, apparatus made by the instructors of the school, either in the shops or in a special room fitted up for the purpose; second, apparatus made by the students working overtime; third, apparatus made by the students in regular hours as a part of their course. The first classification is not within the scope of this paper, but I will note in passing that several schools reported having a special room fitted for this work in connection with the physics department. The principal of the Manual Training High School at Kansas City, Mr. G. B. Morrison, wrote me as follows:

> We have a special workshop connected with our physical laboratory. The apparatus which is made is not in connection with the manual-training department, but is made afternoons by the teacher and his willing pupils. The shop exercises do not include any pieces of physical apparatus. I might say, however, for the possible interest it might be to you, that this school had its beginning through the physical-laboratory workshop in the Central High School when I was a teacher there several years ago. The interest created then for handwork was an important factor in working up popular interest to build the new school which now has an attendance of 1,650 pupils and 53 teachers.

[1] Read before the New England Association of Physics Teachers, Boston, May 24, 1902.

As to results, of course, this is an exceptional case, yet the natural inference would be that in most cases popular interest is stimulated in a more or less degree.

A few schools reported the practice of having students work outside of regular hours in making apparatus, and in some cases they are paid by the hour for such work. This, too, is a phase of the subject outside of the province of this paper, and we will pass on to the consideration of the making of apparatus as a regular part of shopwork.

The letters which I received show that something has been attempted along this line at Boston, Cambridge, Worcester, Springfield, New Haven, Philadelphia, Toledo, Chicago, and Peoria. In Boston the work has been of a limited character. A whirling machine was made a few years ago, and at present one boy is engaged in making some laboratory clamps. The latter, however, are being made on a manufacturing basis, and are therefore outside the present discussion.

The list of pieces made at Cambridge includes pendulum supports, triangles, cylinders, etc., for measuring exercises; scale pans; balance supports; apparatus for index of refraction; Hall and Bergen expansion apparatus; connectors and binding posts; mercury cup pole changers; frictional electric machine; resistance coils; tangent galvanometers; slide wire bridges; stereopticon stand; school telephone system complete, except instruments.

The principal of the Mechanic Arts High School, Springfield, writes:

> We have had some models for vernier measurements made, a frame for wave motion, and a large amount of general laboratory work in wood, such as the setting up of tables and apparatus cases, book cases, etc. Sets of working drawings have been prepared, after sketches made from photographs and catalogue cuts, preliminary to making a number of machines illustrating mechanical motions. One of these machines has already been completed in the machine shop, namely, the differential screw and gear machine. In process of construction we now have a machine illustrating Watt's parallel motion, a heart cam apparatus for illustrating uniform motion, a triangular cam apparatus to illustrate intermittent motion, a quarter-turn belt apparatus, a machine illustrating epicycloidal gear train, and a one H. P. dynamo. All these machines are now going through the pattern-making department. I am also having two special models of electrical machines made up in the machine shop, which I think will be a fine piece of work when completed.

At the Boardman School in New Haven a very great deal has been done along this line. A list of the articles which have been made is not

at hand, but probably it parallels in a measure those elsewhere with some novel and interesting additions. Later on I shall again refer to the work of this school.

The Northeast Manual Training School of Philadelphia, through the physics instructor, reports that altogether about one hundred different pieces have been constructed, but the work has been done almost wholly outside the regular hours and courses.

The director of the Chicago Manual Training School furnished me with the following list of articles which have been made there: Atwood's machine, set of pulleys with stand, toggle joint, centrifugal railway, rotators, parallelogram of forces, organ pipe, set of tuning-forks, Joly's balance, Wheatstone's bridge, revolving mirror, tangent galvanometers, mercury commutators, apparatus for determining co-efficient of linear expansion of metals, steam-engine governor, gyroscope, and steam-engine models—in all, twenty-six pieces.

At the Bradley Polytechnic Institute, Peoria, Professor Bennett writes :

> Our course in electrical construction brings together the shopwork and physics in a decidedly practical manner. For this work we have each boy equipped with a belt containing necessary tools for wiring. We also have special pieces of apparatus for testing, etc.

An outline of the course follows, but I will omit this. He then goes on to say :

> Students taking this work in electrical construction have taken charge of the bells throughout the building and have installed electric lights in several rooms. Just at present they are running a No. 2 light wire to carry current from our main switch board to the Horology building. The entire course is of a thoroughly practical character and is sought by students.
>
> Our physics department has its own little workshop where small pieces of apparatus are made. In our machine shop we sometimes make pieces of apparatus which may be used in physics, in domestic economy or chemistry. At present we are making a stereopticon. In our class in machine design, when students are allowed some choice in the kind of a thing they design, sometimes pieces of experimental apparatus are selected and then, if approved, are constructed in the shop.

Let us next consider what has been observed in the way of results. The testimony of Principal Morrison I have already stated. Principal Mather, of New Haven, says :

> There has been no lack of interest, and we think boys gain a broader knowledge of machine-shop processes because of the character of the work.

Incidentally we are gradually accumulating a valuable lot of apparatus, most of which could not be obtained in any other way. . . . . Apparatus bought of dealers is often unsatisfactory because of poor workmanship and small size.

The many-sidedness of this subject is at once brought into prominence when we attempt to place a true valuation upon it as a whole. Looking at it from the standpoint of the instructor of physics, I shall quote Mr. Stradling. He says :

The apparatus made has, with few exceptions, proved very satisfactory. In some cases its finish and appearance compared favorably with that finished by regular instrument makers. In nearly all instances it has served admirably to illustrate my lectures. Regarded as a means of supplying the physical cabinet, the plan of having the boys make apparatus was an eminent success, and, further, in many cases it developed the self-reliance and ingenuity of the maker.

The problem which confronts the manual training instructor, stated in general terms, is about this : Given a number of students, a very limited number of hours, and certain fundamental principles which are required to be taught, what methods of instruction shall be adopted, what processes employed, and what articles constructed in order that the greatest possible benefit may result to each individual pupil ?

In approaching this matter from the pedagogical view-point it will be well to restate a few of the fundamental principles of our creed : first, it is the duty of the state to furnish the means of education ; second, the school exists primarily and solely for the benefit of the student ; third, it is the function of the school to train boys and girls to become men and women, not to manufacture things. Considered on the basis of the first of these principles the making of apparatus for the purpose of supplying the school is not justifiable. But when considering the second principle, if it can be shown that the building of apparatus for the school will confer a benefit upon the student either in the making or using of it, or both, then it should be encouraged. It is not difficult to imagine local conditions where such would be the case.

A discussion of the third principle stated above involves a long-standing difference of opinion among manual training men as to what should be the character of the articles made. Shall the material products of the shop be mere exercises or useful articles? If the latter, shall the articles be simple individual projects which become the

property of the student, or shall they be large group projects and retained by the school? These are questions which have involved endless discussion and are by no means settled yet. The introduction of manual training came through what has long been known as the "Russian system," having for its characteristic feature the construction of simple exercises, involving principles and nothing more. The "Swedish system," on the other hand, which came in later, makes every exercise a useful model. These two extremes were for some years irreconcilable, but there has been, of late years, on the part of the majority, a strong inclination to adopt both systems and out of them evolve a third which is distinctively American. The pendulum is still swinging, but we are to all appearances gradually settling down to a middle course, and, so far as sentiment has definitely crystallized, it seems to have assumed a form something as follows: whenever possible, the useful model should be employed as it stimulates the interest of the pupil; on the other hand, when the desired results can be secured more quickly, with greater emphasis and to better advantage generally, by means of an exercise, then it is to be preferred.

In further evidence on this point, and that I may show at first hand the feeling of those who by virtue of their long experience and standing in the profession are entitled to express decided opinions on the subject, I shall quote from their replies. Dr. Woodward, of the St. Louis Manual Training School, expresses his views thus:

> We make no special effort in our manual training department to construct physical apparatus, for two reasons: In the first place, the physics comes during our third year. By that time the manual training course has gone on two full years and reached the machine shop; consequently the students have no demand made upon them for physical apparatus until they reach the third year. Secondly, the construction of useful articles is entirely secondary and incidental in our whole manual training scheme. The object of manual training so far as concrete work is concerned is to give an opportunity to learn the uses of the tools, the nature of materials, practical methods of combination, the various methods of constructing and using working drawings, and finally the best ways of adapting means to ends. We find that all these important objects are best secured by the use of exercises specially designed for that purpose. Consequently I always take the ground that the student's time is far too valuable to be employed in the construction of apparatus which involves nothing new in the way of education. For instance, a teacher may find that he needs somewhere a certain box or a frame which any member of the class could easily construct if he had time.

If the construction involved nothing new, it would evidently be a waste of time on the part of the student to construct it, and we prefer to hire it done and allow the student to spend his time in learning something that is entirely new to him. Many people suggest again and again that the student in the shop ought to make this or that article of furniture, or these or those articles of use; they even say we ought to manufacture some article and sell it.

I always reply to such suggestions by saying that our students are too busy with the work of education to stop to earn money or to manufacture articles which we can hire someone else to make. The hours of education are precious and ought not to be squandered by any pretentious effort to convert a school into a factory. The manual training we give is of priceless worth, and even if all the pieces done by the students during the year, in the way of concrete exercises, were burned up on the day after or before exhibition, all the manual training would be left and there would be no great loss to anybody.

I protest in the name of education against the practice which seems to prevail in many schools of squandering fine opportunities for manual training in weak attempts to produce useful articles as the main purpose of the work. In nine cases out of ten where a student sets out primarily to construct something that he has a desire to make, with no sufficient knowledge of how to go to work, and with no workmanlike habits of precision and plan and sequence, the result is a very imperfect specimen — a great waste of time — and a very demoralizing effect as regards details which in the finished article may escape observation.

For instance, a boy will set out to make something which consists of several different parts, with no definite knowledge of how the parts are to be connected and no special interest in the details of such connections, which, after all, are the difficult parts of all constructions. Such pieces usually will not bear critical examination. They mislead the pupil and very often they mislead others who ought to know better.

I should apologize for saying so much, but I feel that the great value of manual training is in danger of being lost by the introduction of a lot of silly sentiment which is unworthy the science of education. If people were to teach algebra or Latin or German in the way some people try to teach manual training, they would hopelessly fail in a very short time.

Professor Richards, of Teachers College, gives his opinions in the following words:

Our thought at the College is rather that manual training finds its best opportunity to embody and apply physical principles in the making of machines and apparatus which have a definite useful character and which bring in physical facts incidentally rather than in the making of physical apparatus aimed at direct illustration of physical laws. I have never found it practicable to do the latter sort of thing in such a way that the connection be-

tween the doing and using was real and vital. The time difficulty is a very great one, and then it seems to me the thing made must always be approached in one of two ways, both of which are rather unsatisfactory: either the apparatus is to be made to prove some law not yet fully understood, in which case the motive in making the thing is rather weak; or it is concerned with the making of apparatus that has been attempted or already approached, in which case it becomes perfunctory. On one or the other horn of this dilemma one seems bound to be caught in approaching the subject. Each year I have come to feel more and more that the natural way in which physical laws are best embodied in our handwork is in an incidental way, such as the law of the wheel and axle through the making of an elevator hoist or the hoisting gear for a mining shaft.

The sentiment which prevails at New Haven is described by Principal Mather as follow:

We, at the Boardman School, have almost entirely given up the so-called exercise system, although sometimes we can get what we want in this way better than in any other. But generally a boy is working on a project of some sort, more often than not on something which he will own when completed, upon paying for the raw material. This is especially true in the first three years of the course. In the fourth or senior year, however, the work is mostly on projects to belong to the school, and many of these are for the mechanical, physical, and electrical laboratories. There is, we think, a marked advantage in this system over the individual project system, provided the instructor is not restricted to a few projects. The secret of success, I think, lies in placing in the hands of the instructor drawings and castings for many such projects. He can then by inspection find the work best suited to each boy, and keep all machine tools in operation.

It is not important that the machine or apparatus should be completed in one year, but every boy should feel that what he makes is intended for some definite place, and will be carefully inspected before being accepted.

Along with the big projects go many small ones, some the work of one boy, but generally of more than one, and whatever is made, with few exceptions, we keep for future use.

From what has been said it will be seen that the objections which are urged against the making of apparatus may be stated as follows:

1. It is unsuited to the ends of manual training. There are certain recognized fundamental principles which must be covered and to that end specific exercises are best.

2. The construction of a piece of apparatus involves too much repetition and therefore wastes the time of the student.

3. It involves group and class work, whereas individual projects are preferable.

4. Physics usually comes so late in the course that there is lack of vital relation between the thing made and the principle involved.

5. In general there is lack of time.

6. The apparatus after it is made is not of much value.

7. The student is usually more interested in a model involving mechanical principles than physical.

8. The student has the first claim on his product. It should be his to take away with him upon paying for the material.

On the other hand the objections may be met by a categorical statement of the advantages:

1. The fundamental principles can be taught as well by useful models as by abstract exercises and afford an additional interest.

2. A certain amount of repetition is to be desired. It serves the same purpose that drill work does in mathematics.

3. Group and class projects are quite as valuable as individual. Both should be used.

4. The fact that the student does not understand the physical law involved is no greater objection to making apparatus than it is to the making of engines and dynamos.

5. There is just as much time available for this work as there is for other.

6. The apparatus made compares favorably with that made by instrument-makers, and in some cases could not be obtained in any other way.

7. A model in which the student is most interested is not necessarily the one from which he would derive the most benefit. In any case the making of apparatus does not preclude the construction of something in which he has a greater interest.

8. While it is a good plan to allow the student to take away most of his models, yet the school has a legitimate claim upon some of them. Furthermore, the altruistic spirit should be cultivated.

From what has been shown it is very evident that there are wide differences of opinion on this subject and it is difficult to form any definite conclusion in regard to it. So far as this can be done, however, I am inclined to think that local conditions must determine in a large measure the feasibility of attempting to construct apparatus. In some cases it might be best to make no efforts in this direction; in others it might be wise to have such work done by students outside their regular hours, either in the shops or in a specially equipped room; and in still other cases it might be very desirable to make apparatus in the regular work of the school.

To make this a little more concrete allow me to quote again from the letter of Professor Bennett:

> I cannot give you anything very definite in regard to this matter because that kind of work has not been systematized, but has been taken up in the most natural way to meet changing demands of the individual students and of the school. So far as we have any correlation between the subjects of manual training and physics I am quite sure that it is of the right kind. We have done nothing to force upon the students conditions which are at all unnatural. I think it is impossible for me to explain just what I mean in regard to this matter, for one has to know the spirit of our school in order to understand the significance of what is being done here.

I believe this is the corner-stone to the foundation of this whole superstructure. Does not practically everything depend upon the working rélations of the two departments? After disposing of all other considerations there yet remains this very important phase of the subject which is perhaps, after all, the vital part of it. If the instructors in physics and manual training are uncongenial, unsympathetic, uninterested, or overburdened already with other work, then any attempts at the making of apparatus are doomed to failure. In the first place, there must be given the right sort of men — men who are willing to do more than the absolute requirements; men who are interested in achieving the same end and are ready to make mutual concessions in one way and another.

It ought to go without saying that the understanding of the fundamental principles of each other's work is an essential. I cannot conceive of a manual-training instructor making much progress in making physical apparatus who is ignorant of the fundamental physical laws. On the other hand, a physics teacher without a working knowledge of drawing can do practically nothing in the designing of apparatus. In addition to a knowledge of drawing it is also very desirable that he should have a general knowledge of materials, tools, and processes. He should know when to use one kind of material and when another in his construction. A knowledge of the methods by which different parts are constructed will save him from the embarrassment of designing irregular and impossible forms. All constructions should be simple and, if possible, so designed that special tools and appliances will not be required in making them. Parts calling for irregular sizes or special stock should be carefully avoided. It sometimes requires more time and labor to secure special stock than to do the actual work of making. Whenever practicable, it is well to use standard forms; this

is particularly true regarding screw threads. Whenever a standard thread can be used, doing so may save the necessity of making or purchasing a special tap. There are in existence several tables showing standard sizes and forms of stock, tools, and machine-parts with which every one who is interested in this work ought to supply himself. The teacher of physics should also have at hand complete data as to the sizes of drills, reamers, taps, and stock in general with which the manual training department of his own school is equipped. The sketches should be carefully figured, and *exact* measurements should be given in thousandths of an inch.

I do not mean to suggest by what I have said that the instructor in physics should do all the designing unaided; but rather, after he has prepared preliminary sketches on cross-section paper he should consult with the instructor in drawing who will go over the matter carefully and as soon as practicable have the drawing laid out. After it has been penciled in, the instructor in whose shop the piece is to be built should be asked to look it over; then a conference of the three instructors should be held to put it in final shape.

The constructing of apparatus which is too complicated or difficult should be avoided, also anything that involves the making of a large number of duplicate parts; for example, electric connectors.

To sum the matter up, the conditions which ought to obtain in order to realize the greatest value in making apparatus as a part of the course in manual training are about as follows:

1. The student should have had enough physics to enable him to have a fair conception of the physical laws involved in the apparatus being made.

2. The pieces selected for construction must be good manual-training models.

3. There must be time enough to complete the models successfully without robbing the student of more essential problems.

4. The pupil must not be deprived of making a mechanical model which appeals to him more strongly in order to make a piece of physical apparatus.

5. There must be a proper spirit and a manifestation of cordial relations. There can be no correlation of physics and manual training unless there is co-operation between the instructors.

6. Whatever is attempted must be natural and not forced. Let it be a spontaneous development of a normal, healthy growth which has for its soul the spirit of the institution.

In closing I would suggest that the *best* correlation of manual training and physics is to be found in the applications and illustrations and physical laws and phenomena from day to day throughout the course in shop practice. A single example will suffice to illustrate: A boy is turning a piece of steel; the chips fly off hot and smoking; the tool grows warm. A more opportune moment could not be imagined in which to point out the law of the transformation of energy. Unfortunately physics usually comes so late in the course that much which otherwise might be gained is now lost.

Is it not feasible, therefore, to divide the work in physics into two courses: an elementary course which can be given during one-half of the first high-school year, and an advanced course coming in the third or fourth year? The elementary course would consist chiefly in the presentation of physical facts and phenomena, while the advanced would deal mainly with the mathematical and experimental features of the subject.

VENETIAN IRON WORK IN THE SCHOOL.

DANIEL UPTON,
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THE following suggestions are based on class-room observations extending through four years, and they are presented here in the hope that they may assist someone who is searching for a medium for manual training which is both economical and capable of various adaptations.

Several features make the work particularly valuable. Through it the pupils may bring to a living reality many principles taught in the art work which would otherwise never reach fruition, and would consequently not be of greatest benefit to the children. Its projects may be graded to conform to the peculiarities of the individuals of the class, and children can really finish some workable object in short sessions. It cultivates the touch and the sense of discrimination through the touch. An added value comes from the fact that later on, in combination with woodwork, the Venetian iron work widens the range of the pupils' abilities. We frequently find pupils in the woodwork using their knowledge of both iron and wood in planning new undertakings.

About the only objection to it which has been advanced is that the manual operations are so limited. They are no more so than in wood-carving, and not so much so as in sewing. In constructing a project very few curves are exactly similar, and each new curve and each size of iron calls for a new discrimination in muscular sense.

The materials.—Venetian iron is a band iron of varying widths and of such thickness as will permit of its being bent into form by means of small hand pliers. It may be bought either in coils or straight pieces. In fact, No. 22 gauge sheet iron may be cut into strips and used in place of the specially manufactured material.

Very few articles could be made from one continuous piece of iron, consequently methods of fastening pieces together are needed. Two pieces crossing each other may be fastened together by punching a hole in each piece and riveting them, or the pieces may be tied together by means of a fine wire. The rivet, however, makes a much more satisfactory fastening. In order to punch the rivet hole one may employ a small nailset, laying the iron either on the end of a block of

hard wood or on a block of lead, and driving the nailset through it; or one may, for a small amount, buy a "universal punch," with plunger to match an eight-ounce rivet.

When two pieces which extend in the same direction are to be brought in tangent and fastened to one another, they may be riveted, but ordinarily it is better to use "binders"—little U's of narrow iron whose distance across is equal to the width of the iron, and with length of uprights such that when bent over they will just snugly surround the two pieces of iron. Binders may be bought by the pound in widths, varying by sixteenths, from one-eighth up to three-eighths of an inch.

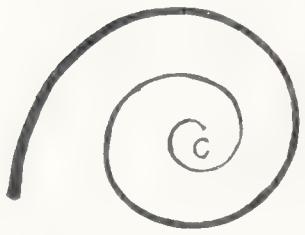


FIG. 1

FIG. 2.

Where three or more pieces are to be bound together, special binders with longer uprights may be made by the pupils. Where three or more pieces are to be riveted, rivets of special length will be needed and may be secured to order at a trifling cost.

For cutting the iron into proper lengths and cutting patterns out of tin, a pair of "tinner's snips," No. 9, will be needed, and each child should have a pair of both 5-inch round-nosed and 5-inch square-nosed pliers.

For riveting, there will be needed some sort of anvil; a "needle case stake" will answer both for this and as a former for rings and other curved forms. One also requires a rivet-set to fit the size of rivets used. The binders may be pinched about the iron by means of the pliers.

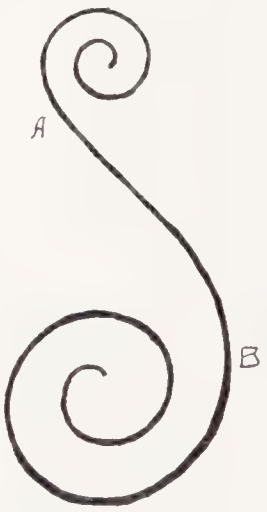


FIG. 3

The operations.—In constructing a piece of Venetian iron work full-sized patterns must be drawn for each part, and in the process of bending the iron should be frequently applied to the drawing to test the accuracy of its lines.

When the patterns have been drawn, the lengths of the curved pieces may be determined by bending a piece of twine along the entire length of the curve. The length of the circumference of a circle may be secured mathematically, and it affords an illustration of the advantage of knowing the relation which exists between the radius and the circumference of a circle.

In cutting the iron for circles or rectilinear figures allow about three-eighths of an inch additional length for riveting or binding.

When pieces are to be bent into rectilinear figures, the length of the different sides must be marked off with a pencil or sharp awl before the bending is done. In order to secure a sharp bend the iron must be held in a small vise or the square pliers, and, with the thumb placed against it close down by the vise or pliers, pressed over sharply to the required angle.

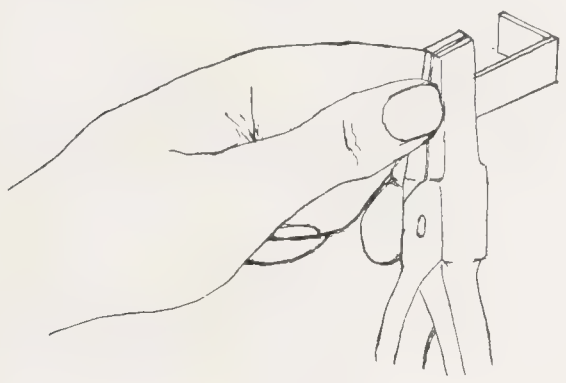


FIG. 4.

In bending the spiral the end of the iron which is to be the center of the spiral should be either filed thin or cut tapering for an inch or so, in order that the part which requires the sharpest curve may present the least resistance. With the round-nosed pliers begin at the end (C, Fig. 1) of the iron and bend it by successive steps, testing at each step, till it fits the pattern. Care must be taken not to make too sharp a bend and thus "kink" the iron. When a piece is to have a spiral at each end, as in Fig. 2, begin at each end and bend toward the middle of the iron. In the longer curves, as from A to B, Fig. 2, it is generally easier to do the bending with the fingers, and not use the pliers. When a piece is to have a spiral at each end and a reverse curve between them, as in Fig. 3, bend the spirals with pliers and the curve A–B with the fingers.

Occasionally it is desirable to twist a portion of a piece either for constructive or decorative purposes. To do this mark off the portion to be twisted and fasten one end of this part in the vise. Grip the other end of this part in the square pliers and twist it, being careful to keep the axis of the iron straight.

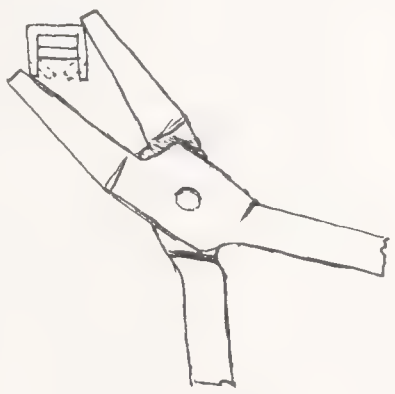


FIG. 5.

The range of projects.—As to the range of projects, it is extensive and varied. It will not be the purpose of this paper to outline a "course." The course adopted in the Buffalo schools has been built up from fragments gathered from the store, the school, the kitchen; in fact, from any place where the needs of the case seemed to indicate that an object made of iron or tin would serve a purpose satisfactorily. Teachers have brought ideas, pupils have in their own experiences found

places where the iron work was needed; and, in fact, the principal effort on the part of the specialist has been to guide the enthusiasm and originality in ways of proper design. The teacher who in a few simple models teaches the fundamental operations and then calls upon the observation and the inventive talents of the class, will not lack for suggestions from which she may build a course.

Allied materials.—Along with the iron, tin may be used as parts of various projects, and, of course, glasses, jardinieres, and other recepta-

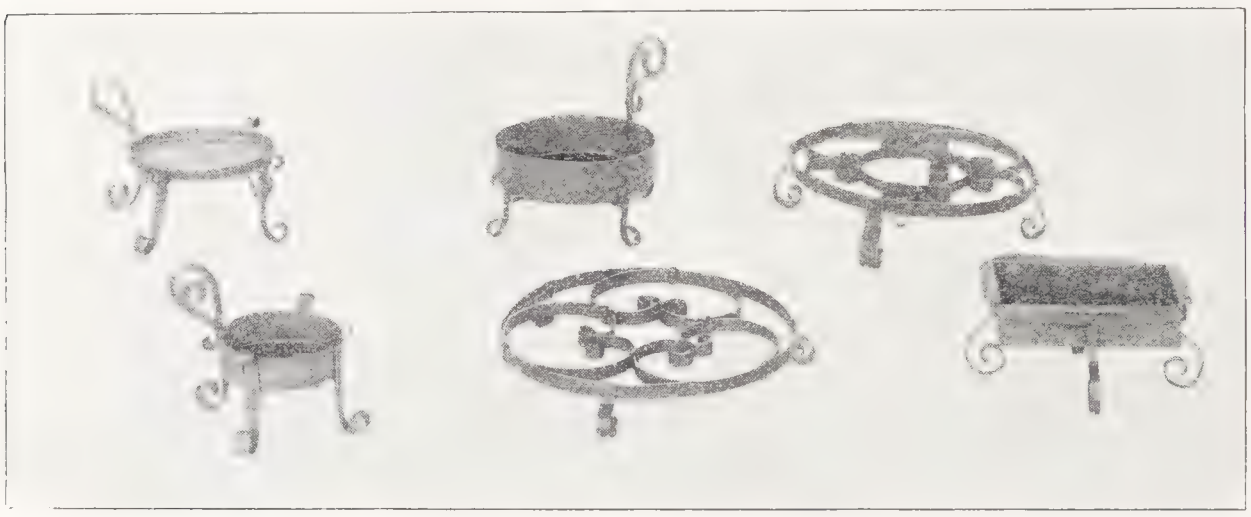


FIG. 6.

cles will be brought from home and will afford an opportunity for designing and making proper supports. Some of the most interesting exercises are those in which the class takes an object which has hitherto been considered useless, and by their handiwork create from it a thing of beauty and usefulness. Broken goblets, baking-powder cans and covers have been reclaimed from the garbage barrel and have emerged from the hands of our youthful workers as pansy glasses, flower-pots, or pin-trays — an excellent training in thrift.

The cuts show a few of the projects constructed, and are to a large extent original designs by the children. Among them are easels, pin-trays, match-boxes, frames, candlesticks, ink-stands, jardiniere stands; in fact, the undertakings, though graded in complexity, are as varied as the experiences of the pupils.

In the Buffalo schools this work is done in the seventh grade. There has never been any lagging of interest in a class, and not one where the teacher could not notice marked improvement in the individual work and in power for both independent planning and execu-

tion. Twenty regular grade teachers are giving lessons to their classes, and special teachers instruct probably as many more; and the writer, from the experience and observation mentioned, feels abundantly warranted in recommending this medium both on account of its educational value and its economy.

CONSTRUCTIVE DESIGN IN WOODWORK. III.[1]

WILLIAM F. VROOM,
New York.

THE term "woodwork" in the heading of these articles was selected as being more inclusive than "cabinet-making" or "furniture-making," for the principles enunciated are applicable to a much broader range of work, though, as already intimated, it is not the intention of the writer to treat specifically of those branches in which large timbers are used. Many general principles, it is true, apply equally in all wood construction, large or small; yet methods are considerably modified by the size and character of the thing designed. The framing of a house, for instance, differs materially from that of a bookcase, and the construction of a barrel has little in common with that of a chest.

The difference in principles of construction between large and small work is due to various causes. The elements in the latter must be much larger in relation to the size of the structure, not only because the strength of a piece of timber diminishes as the square of its length (supposing breadth and thickness to diminish proportionately), but also because the smaller article is subject to relatively greater strains. No framed house, for example, of ordinary construction, would withstand the strains which a trunk has to bear at the hands of the gentlest expressman. The use of the brace, so common in house-building, is comparatively rare in smaller work, especially cabinet work, where the relatively large framework and the use of glue render the article sufficiently rigid without it. Furthermore, the provision for warping and shrinkage is an object of much greater concern to both the cabinet-maker and joiner than to the carpenter, who constructs only the framework of houses, because in interior work the greater part of the framing is exposed and liable to close inspection, and the lumber used is in much wider pieces, relatively, than the carpenter has to deal with, and consequently requires greater skill in its disposal.

I have alluded to the use of glue as a factor in the modification of constructive design under varying conditions. It may be well here to deal with this matter frankly, with a view to determining how far such

[1] Article I of this series may be found on p. 83 of Vol. I; article II on p. 25 of Vol. II.

a factor is entitled to recognition. There seems to be an impression in many minds that glue is a convenient resort of incompetent workmen to hold work together which, if properly done, would have held without it. That glue may sometimes be used in this way I do not care to deny, but it is true, nevertheless, that gluing wood together is as legitimate a process as welding iron or soldering brass, and the cabinet-maker who is not an adept in the art of gluing is not a master of his trade. Rigidity is usually a requisite in articles for indoor use, and if this may be obtained in some cases by means of screws, wedges, and joint bolts, it may be had in others with equal honesty and greater elegance of design by the use of glue. A joint held in place by adhesion is, in general, stronger, as well as neater, than if secured by any other means. In the class of work under consideration the designer should feel free to use glued joints wherever conducive to strength and neatness, provided the reasonable rules of construction are not disregarded.

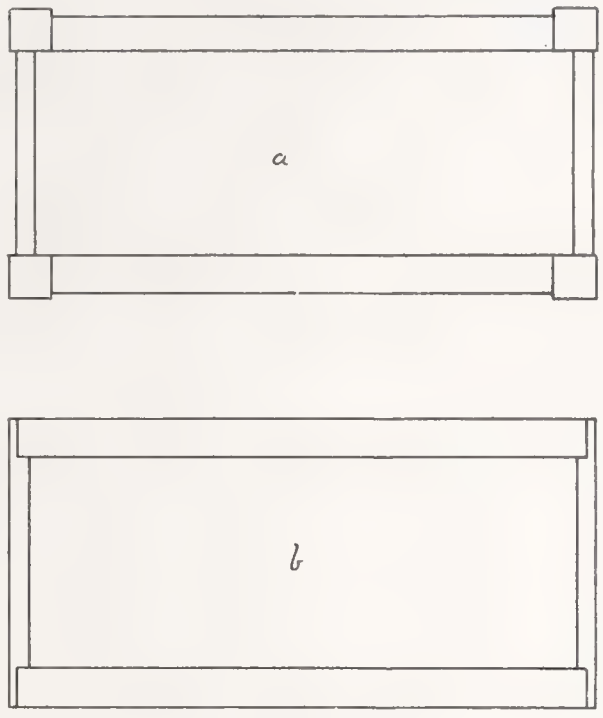


FIG. 1.

"Case work" is a term used to denote such articles of furniture as chests of drawers, bookcases, cabinets, sideboards, wardrobes, etc. In general, these have level surfaces and straight lines, though many examples may be seen, both ancient and modern, in which curves predominate. The joints used in their construction include a considerable variety, such as the mortise-and-tenon, the dovetail, the tongue-and-groove, lapped, and housed joints. Since special methods of framing must be employed for special designs, it is difficult to formulate principles of general application. From those laid down in previous articles on this subject we might reasonably conclude that the main frame of such a piece of furniture would consist of four stout uprights framed together with four top and four bottom rails, secured with mortise-and-tenon joints; and this is, in fact, one of the methods in common use, though not in all cases the most suitable. An alternative method is to form the end of the case of a solid piece, or a paneled frame which may be treated as a solid piece, the carcass being

completed by inserting cross-rails with any suitable fastening. The difference between the two methods will readily be seen by reference to the plans, *a* and *b*, Fig. 1. The first is undoubtedly sound in principle, and may be adapted to almost any piece of case-work by a designer of intelligence and originality. It is not, however, the method most in favor among cabinet-makers, though it is used nowadays in a more or less modified form in furniture factories in the construction of bedroom furniture, sideboards, etc. The second method

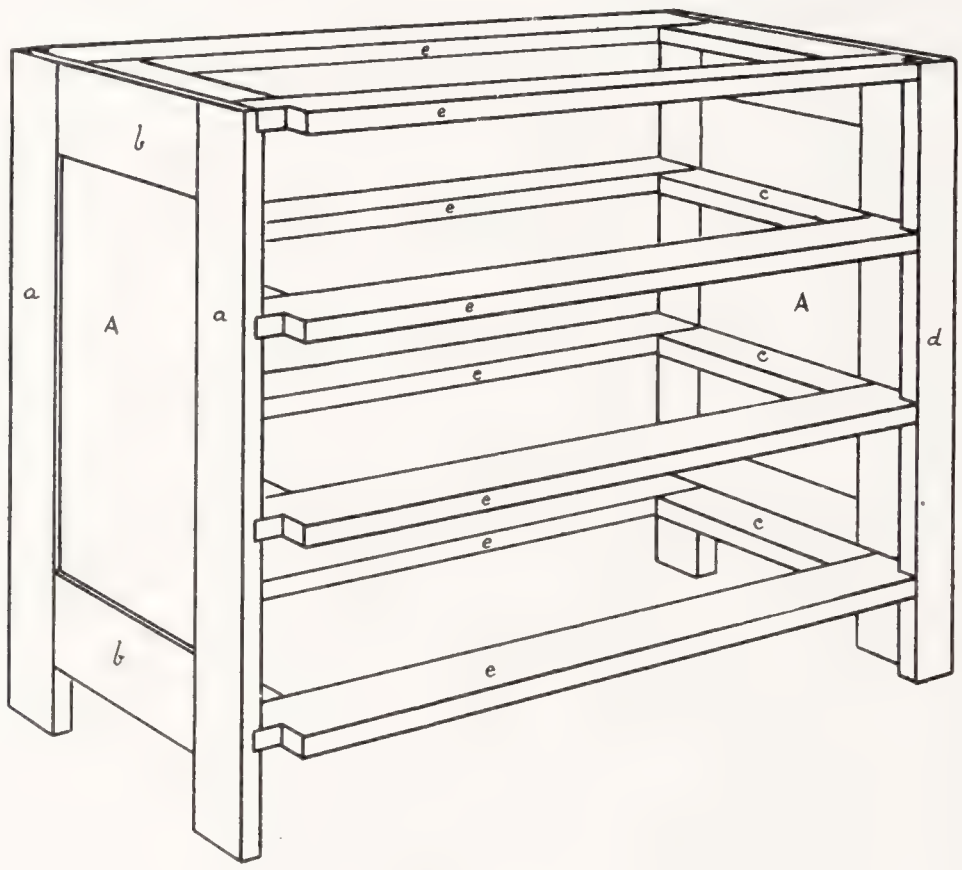


FIG. 2.

is obviously the one best adapted to bookcases, small cabinets, etc., in which the depth is inconsiderable; but it is also the one which has become crystallized by usage among good workmen for generations, in framing chests of drawers, secretaries, and general case work of average size and simple design.

A description in detail of an ordinary chest of drawers may serve to illustrate the application of several principles already stated. This, while it does not contain full directions for the workman who makes the case, may appear to some readers to deal with matters in which the designer is not directly concerned. If so, I would point out that the designer is concerned in *everything* which is necessary to the intellectual equipment of the skilled workman. The decadence of design began when the artisan ceased to be the designer. Referring to the

sketch, Fig. 2, the ends *A* are first made, the stiles *a* and rails *b* being of boards, say 7/8 inch thick, and the panels of thinner stock. The mortise-and-tenon may be used here, but it is not generally necessary, as the framework is sufficiently strengthened by what is added later. The usual method is to carry the groove the whole length of the stile and work a tongue on the end of the rail to fit it. In accordance with a

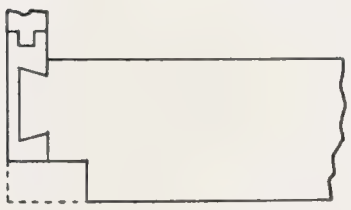


FIG. 3.

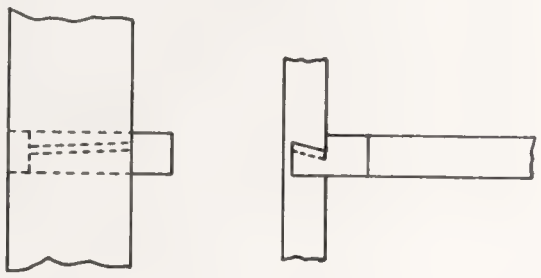


FIG. 4.

rule (No. 4) suggested in the first article of this series, the panel should work freely in the groove, a little glue being used at the middle of the ends so that shrinkage and expansion may work to and from the center rather than from one edge to the other. To provide for expansion, the panel, taking it for granted that all stock is thoroughly dry, should be made about 1/4 inch narrower than the space allowed for it. Neglect of this precaution often results in the rupture of joints in damp weather, or when the work is in any way exposed to moisture.

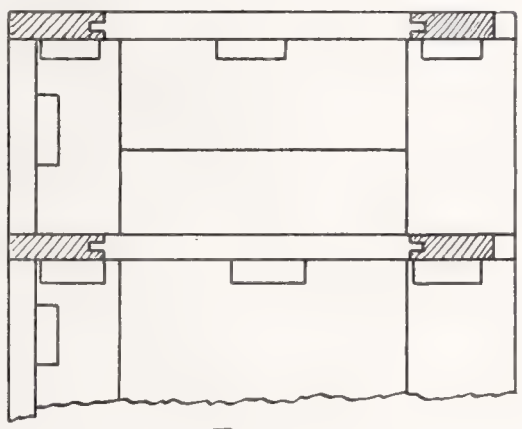


FIG. 5.

These paneled ends are now treated as solid pieces, and prepared to receive the partitions, *e*, which, when secured in place, will complete the main framework of the case. In handwork of the better class the partitions are generally fastened by means of dovetail joint, the top being let in as shown in Fig. 3 (plan view), and the others as shown in Fig. 4. The dovetail here is tapered and driven in from the front, thus making the joint tight and the structure solid. The ledges, *c*, Fig. 2, are set in between the front and back partitions with tongue and groove joints. These are glued at the joints, and also glued to the panels. It will be observed that the front partitions are notched to receive the facia pieces, one of which, *d*, is shown in the drawing, and the other omitted. Blocks are glued in beneath the partitions and ledges, and behind the facia, to render the carcass rigid (Fig. 5).

The construction of drawers in cabinet work is a matter which admits of little variation. The sides, front, and back are framed together, preferably with dovetail joints, the dovetails being formed on the side pieces, and the mortises cut in the other parts (see Fig. 6). Front and sides are grooved to receive the bottom, the lower edge of the back coming flush with the top of this groove. The bottom of the drawer slides under the back and into the groove, the grain of the wood always running parallel with the front, whatever the shape of the drawer. The front edge of the bottom is glued fast in the groove, the rest being left free to shrink and expand, except in large drawers, where some support at the back is necessary to prevent the bottom from sagging. In the better class of work grooved strips, as shown in section in Fig. 7, are sometimes used to support the drawer bottom, being glued to the front and sides of the drawer. The weakening of the sides by grooving is thus avoided.

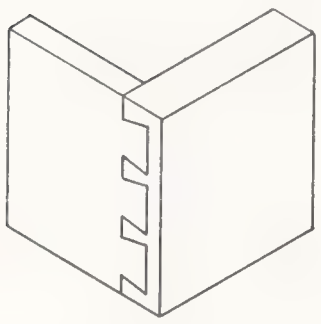


FIG. 6.

FIG. 7.

The drawers being adjusted in their places, guiding strips are fitted to them and glued to the ledges. The top is then secured to the carcass, and lastly the back put in. A plinth may then be carried round the bottom of the case, or some other finish used, according to the taste of the designer.

Chiffoniers, cabinets, secretaries, etc., whether fitted with drawers or doors, are generally framed in a manner similar to the above. In a bookcase the shelves, if stationary, are let into grooves, as are the partitions and ledges in the bureau. Whatever its breadth or height, the bookcase is not made, in general, more than fourteen inches deep over all ; the ends, therefore, may be made of solid boards, though they are frequently paneled. The maximum length of shelves between supports should be about three and a half feet. As the case will depend chiefly upon the back for its stiffness, the latter should be solidly framed and paneled, the uprights being rabbeted to receive it.

An old English sideboard of the period of William III., illustrated in the sketch, Fig. 8, plainly shows its construction. It is simple, solid, and well adapted to the place it has to fill in the economy of the household. Certain modifications might be suggested as calculated to add to the strength of the framework — for example, a middle support at the back, with a cross-rail connecting it with the front — but with

sufficiently stout material the construction shown would need no additional strength. The placing of a support under the middle of a drawer, instead of under the uprights between the drawers, might be regarded as doubtful practice, but I venture to think that in this case the design is satisfactory from all points of view—from the structural standpoint, because the rail supported is evidently strong enough to resist many times the strain to which it would be subjected; and from the æsthetic standpoint, because there is no *apparent* weakness, this latter condition owing largely to the introduction of the brackets.

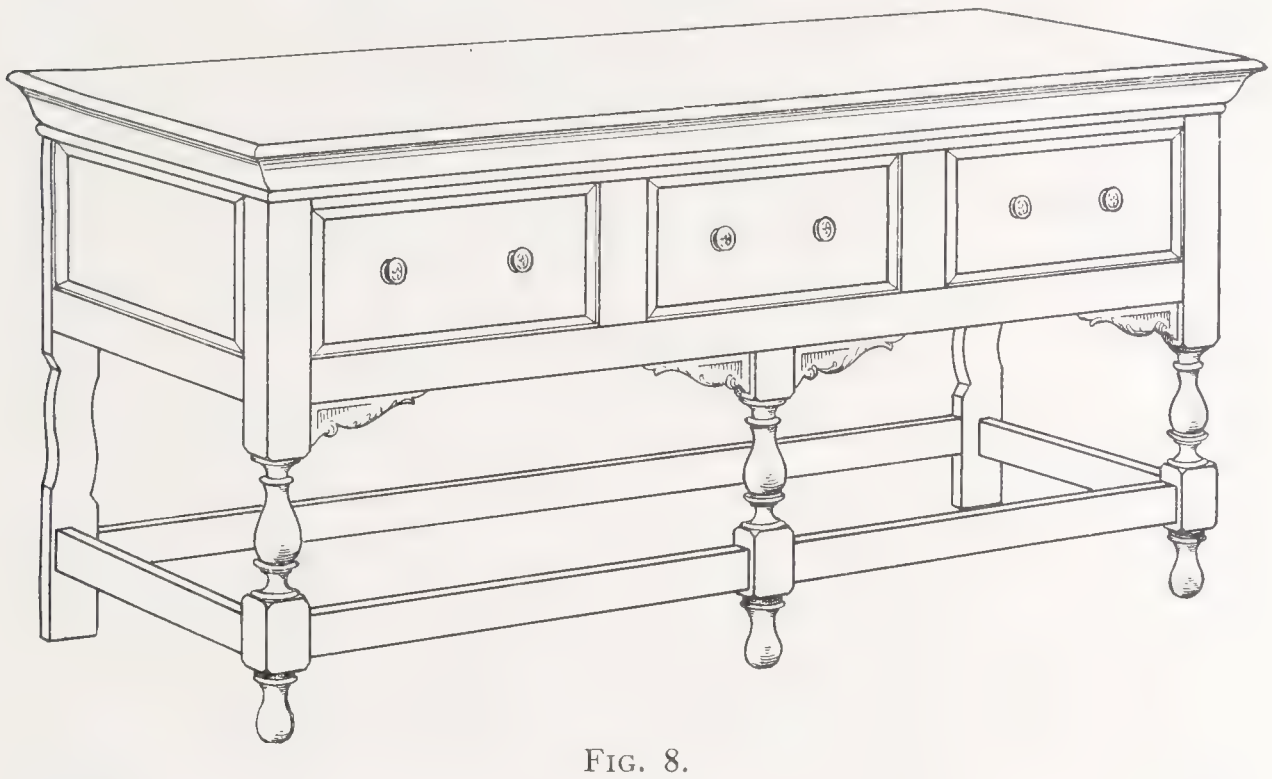


FIG. 8.

Reverting to the construction of the chest of drawers as described, it may fairly be asked, in view of what I have said about truthfulness, whether I am quite consistent in recommending a scheme in which the methods of joining are not evident, and the whole structure, too frail to stand the test of use, must be reinforced by pieces, which are not part of the framework, stuck on and hidden from view. For the answer let us examine the matter a little more in detail. Blocking, to add strength and rigidity to a framework, is practiced wherever the cabinet-maker's art is known. It is an effective and convenient means of attaining this end, corresponding to the use of braces in house-building or knees in ship-building. That the blocks are concealed is an accident. They are placed where they are needed. If this means of strengthening the frame were not honestly available, stouter materials and stronger joints would be used, making the case heavier and more bulky. What, then, do we mean by untruthfulness in construction?

Surely not the mere placing of a joint or a reinforcing element where it is not seen. The sort of untruth against which the logical mind or the æsthetic instinct rebels is rather the concealment of the real construction for some ulterior reason; giving the semblance of a construction which is not the real one or which is of an impossible character; making the real construction evidently weak, inadequate, and unsuited to the material used. As examples of this kind of bad practice I may mention the immense buildings of brick and stone which may be seen in any of our cities, with no apparent support but sheets of glass. In others the lack of support is not only apparent, but actual; I refer to

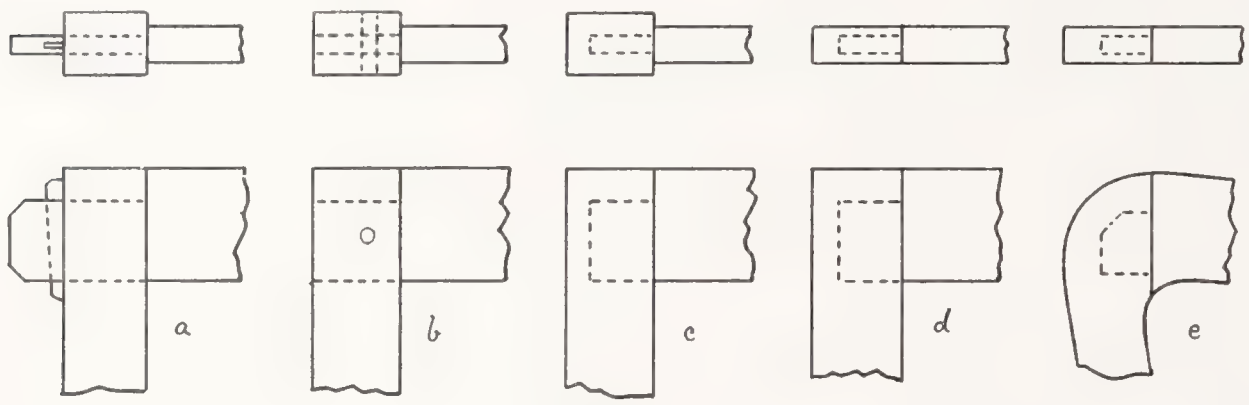


FIG. 9.

those buildings in which the corner is rounded and pierced by a large arched window or doorway in the lower story. In the line of furniture this untruthfulness is met with chiefly in such cases as I have pointed out in former articles. Tested by these standards, it would seem hypercritical to condemn the construction under consideration on the ground that it is untruthful.

This matter may be further illustrated by a comparison of the pieces shown in Fig. 9. As the question of strength is not at present under discussion, let us suppose each piece to be strong enough to serve its purpose—which is, or how many are, artistically bad because of structural untruthfulness?

The keyed mortise-and-tenon, *A*, shows not only how it is put together, but how it is held there, and that with a frankness which is refreshing to the lover of truth. The next example also shows its construction, though somewhat less obviously than the first. At *C* we have a blind mortise-and-tenon. That there are two pieces joined at right angles is plainly evident, but there is nothing whatever to indicate how they are joined. At *D* the same joint is repeated with the pieces planed flush. There is no evidence of the method of joining, and only the grain of the wood remains to show that there are two

pieces. The last example shows two curved pieces joined with the blind mortise-and-tenon.

It will be readily seen that we have here at one extreme the predominance of the constructive idea, and at the other the subordination of construction to fancy. In the first example the designer has had his material uppermost in mind. His joints must be wood joints, his outlines wood outlines, his ornamentation must never ignore the character of his material nor the necessities of construction. The motive of the other designer may be summed up thus: Here is a design which I have endeavored to make graceful in outline and pretty in detail; make the article of any material you please, use any kind of joints you think necessary, and place them where you like, so long as you do not make them too conspicuous or interfere with my lines. If they cannot otherwise be kept out of sight sufficiently, we may paint them or gild them, or at least carry a bit of carving over them in such a way as to deceive the eye. Thus the essential things are made secondary and the plainest principles of art ignored.

But what of the other joints? It seems but a step from one to the other throughout the series. Where should we draw the line? In the writer's opinion the line should be drawn between *D* and *E*, there being no reasonable objection to any one of the first four. Though a grim determination to make everything proclaim the whole story of its construction is not necessary to truthfulness, yet the exposure of tenons secured with keys or pins may often be turned to good account as features of a design. As regards *C* and *D*, nobody objects to the way an ordinary door is put together, whether the tenon is visible or not. The flush construction is, in most cases, the natural one, and the blind joint is not only, for the cabinet-maker's purpose, as good as the one which is keyed or pinned, but generally better. Each joint is good in its place. If there is but a step from *D* to *E*, it is the step which crosses the limit of a rational conception of truth in art. At *D* are evidently two pieces joined at right angles with no attempt to make them appear otherwise. At *E*, on the other hand, where the outline is made continuous, a single piece would obviously have suited the designer's purpose better, if other considerations had not rendered two necessary. The *joint* is the same in both cases (except that in the latter it is necessarily smaller, and therefore weaker); but in the one instance it takes its place naturally, honestly, and in harmony with the lines and the character of the work, whereas in the other its rigid straightness, with the perpendicular lines of the grain,

gives the lie to the flowing outlines of the pieces which it unites. When a joint becomes a necessity in construction, but an impertinence in design, it is time for the designer to stop and think.

In case work, as in all lines of woodwork, that construction is best which is most straightforward, treating wood as wood, and never attempting to imitate forms adapted only to other materials. To make a design which is strong but ugly is bad taste; to make one which ignores sound construction is both bad taste and bad morals.

THE SOLID RAFFIA BASKET.

ADELAIDE MICKEL,
Bradley Polytechnic Institute, Peoria, Ill.

THE inquiries that have come to us during the last few months have led us to believe that many readers of the MAGAZINE are desirous of obtaining information concerning the details of the processes of basket-making. The demand for information concerning the use of raffia seems greatest, probably because less has been written on the use of raffia than on the use of rattan. Until this demand is met in a better way, we hope to publish from time to time brief working directions for typical forms of basketry. Of these, the present article is the first.

The process here described is not suited to very young children, but is of value in advanced classes; it offers favorable opportunities for designing. No attempt is here made to suggest methods of presenting the subject to classes; nothing is said of the place of basketry in school work or its relation to other subjects. At this time we present merely a description of the process of construction, hoping it will be helpful to some of our readers.— THE EDITOR.

The solid raffia basket is made by wrapping strands of raffia around a continuous coil of raffia and fastening them by sewing through the adjacent part of the coil at regular intervals.

FIG. 1.

FIG. 2.

Take fifteen or more strands of raffia in a bunch to form the coil or foundation of the basket. Thread a darning needle with a selected smooth strand of raffia. This will be used for the wrapper. To start the bottom of the basket, place the ends of the strands of raffia for the coil together. Begin by winding these with the wrapper for about three-quarters of an inch (Fig. 1); then form a loop (Fig. 2) and take stitches through this loop to fasten securely. This forms the first convolution of the coil of the basket.

Continue the wrapping, taking a stitch through the coil every quarter of an inch, or as often as is required by the design, until the first row or convolution having stitches has been completed; after that the stitches should be taken so that they will form a radial line starting with the stitches in the first row and running to the top of the

basket; that is, the stitches in the second row must be over or very close to the corresponding stitches in the first row, the stitches of the third row over the stitches of the second row, and so on (see Fig. 3). On this account it is important that the stitches be well spaced in the first row. As soon as the stitches are about half an inch apart start new rows of stitches half-way between the rows already begun. Add

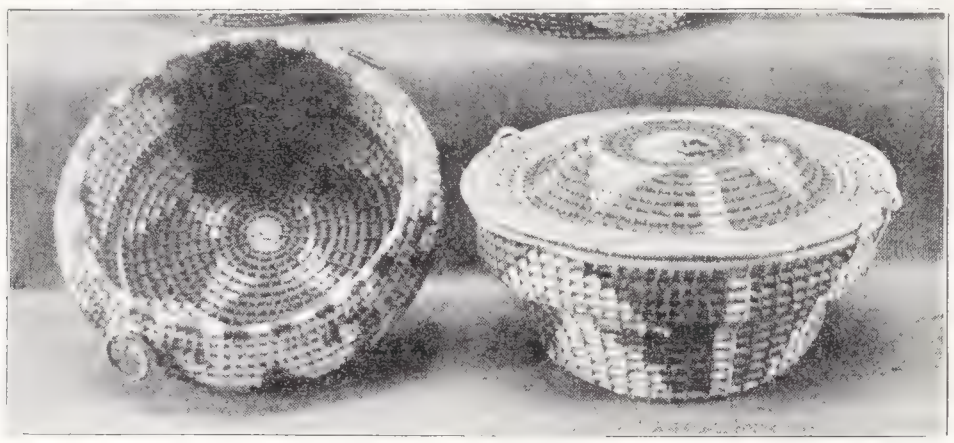


FIG. 3.

stitches in this manner as the basket increases in diameter. If it is thought desirable, these rows of stitches can be carried up spirally instead of radially, the important thing being that the placing of the stitches be according to some order that will add to the beauty of the basket.

As you proceed keep adding raffia to the coil so that its size shall not change. Do not use a wrapper to its end before starting with a new one, but when it gets too short for convenience or too near the narrow end of the strand, lay its end down in the coil. Some time before this is done, however, a new wrapper should have its large end placed in the coil, so that it will be firmly fastened when the old one is discarded. If this has not been done, the same result may be accomplished by placing the large end in the other direction and wrapping over it as you proceed. After threading the needle with the new wrapper, you can proceed as before.

FIG. 4.

FIG. 5.

In using different colors of raffia in the design of such a basket, put the colored raffia into the coil, as you would the other raffia in starting a new wrapper, taking up each color and putting it back as often as is necessary. In such work it is often convenient to use as

many extra needles as there are colors of raffia, thus saving much of the time spent in threading.

The coil can be formed into almost any shape of basket, but the simpler forms are far more satisfactory than the complex ones. In forming the basket the most difficult part is in keeping the curves of the outline smooth. If the coil is drawn in too much during one convolution and then loosened on the next, the result is unsatisfactory (Fig. 4). Even tension, which necessarily involves considerable skill in working, is necessary to produce a basket with a graceful outline (Fig. 5).

The baskets shown in Fig. 3 were made by Miss Emma Coleman, a member of the Basketry Guild of Bradley Polytechnic Institute.

ASSOCIATIONS.

CONFERENCE OF ACADEMIES AND HIGH SCHOOLS, UNIVERSITY OF CHICAGO.

THE sixteenth educational conference of the representatives of the academies and high schools affiliating or co-operating with the University of Chicago was held in Chicago on Friday and Saturday, November 7 and 8, 1902. As usual, the conference began on Friday afternoon with the president's reception and luncheon. This was followed by the executive session of deans and principals with the board of affiliations. A general conference was held on Saturday morning and departmental conferences in the afternoon.

The general conference on Saturday morning was the most important session, and although these conferences are always stimulating, this one has seldom, if ever, been surpassed in the importance of the subject discussed and the interest manifested. The topic considered was "The High School of the Future." The discussion was focused upon the following propositions:

1. To reduce the number of years of the elementary school from eight to six by transferring the eighth year to the high school and reducing the remaining seven to six.

2. To increase the number of years in the secondary school from four to six by adding the present eighth grade of the elementary school and the present freshman and sophomore years of the college, and then condensing these seven years into six.

The first proposition was presented by Superintendent F. Louis Soldan, of St. Louis, and the second by President Harper, of Chicago. Mr. Soldan believes that a seven-year elementary school with a possible six-year for talented pupils is practicable and desirable. He would make the course of study more flexible, abolish examinations as the basis for promotion, reduce the time spent on geography, omit technical grammar; in short, he would reduce the amount of data given in the elementary school and devote more attention to methods of using data. "Too many details clog thought."

In discussing the second proposition President Harper said that such a plan would fit in with—

"*a*) The necessity, so widely recognized, of lifting the standard for admission to the professional schools.

"*b*) The general feeling that in some way or other time must be saved in the preliminary stages of educational work in order that men and women may enter upon their life-work at an earlier age.

"*c*) The practice recognized in other countries, of drawing a sharp line between the work of the *Gymnasium* or *lycée* and that of the university.

"*d*) The practice, now in common vogue, of making the first two years of college work only an extension of the work in the secondary school.

"*e*) The contention, which seems to be well-founded, that much of the secondary work of today was college work thirty years ago.

"*f*) The tendency, already manifesting itself in some quarters, in accordance with which high schools are offering postgraduate work, and universities are accepting this work in lieu of the work of the first two years.

"*g*) The principle that the line of separation at the close of the second college year is much more clearly marked, pedagogically, than the line at the close of the present high-school period.

"*h*) The tendency, everywhere apparent, to extend the scope of the educational work offered by the state or municipality.

"*i*) The tendency, already beginning to be noticed, among smaller colleges to limit the work offered to that of the preparatory school and the first two years of college.

"*j*) The opinion, not infrequently expressed, that the work of the eighth grade is in some measure superfluous for certain classes of pupils, and in some measure injurious to certain other classes.

"*k*) The belief, more and more generally accepted, that the work of the school must be adapted to the needs and possibilities of the individual pupil, rather than that pupils should be treated in mass.

"*l*) The principle that a pupil giving evidence of ability to do the highest grade of work may profitably be excused from doing the same amount of work required of the pupil of lower grade."

An illustration of a seven-year elementary school system was presented by Mr. E. A. Gastman, who for forty years has been superintendent of schools in Decatur, Ill. Mr. Gastman told how a seven-year system had grown up by accident in his city, and then cited statistics to show that attendance in his high school is larger than in high schools of other cities of the same size in Illinois. Galesburg is the only other city having as large graduating classes, and that city has only three years in the high school and eight in the elementary school. Graduates of the Decatur High School are doing as well in the universities as those from high schools in other cities.

Professor John Dewey said that the elementary-school period is now too long for its own function, if the school devotes itself to its work with clearly defined aims. On the other hand, the high-school period is too short for the accomplishment of its own proper work. The time now allotted to the elementary school suggests a lack of aim. The change that is wanted is an internal change, not merely the lopping off of a year. Such a change need not interfere with the enrichment of the course.

Considering the sweeping character of the changes involved in these two propositions, it is significant that no serious opposition to them was developed in the discussion. At the close of the session the conference recommended the appointment of three committees of seven each to consider the general problem presented at the meeting; the first committee, from the point of view of the elementary work; the second, from that of the secondary; and the third, from that of the college; these three to form a joint committee of twenty-one. It is expected that the University will appropriate $500 to defray the expenses of this committee.

SCHOOL CRAFTS CLUB OF NEW YORK CITY.

THE School Crafts Club of New York city held its first stated meeting of the season at Hotel St. Andrews, November 14.

After a short business session the program of the evening was taken up. Speci-

mens of work from the vacation schools and the public schools of the city were exhibited. Mr. Mohr explained at some length the steps of the process by which the models of the public-school course were worked out. The pupil first made a working drawing from a plain model prepared by the shop instructor. He then made, under the direction of the class teacher, an original modification of the outline of this model and applied it to the wood as the model was being constructed in the workshop. An original design in colors was then made in the class-room on paper, this being copied on the wood and the model finished under the direction of the workshop instructor.

Some very interesting photographs were shown by Mr. E. D. Griswold. One of these exhibited a group of boys of Public School No. 1, all of different nationality. Another showed an ungraded class in the same school, consisting of mentally or morally defective boys of various ages, others showing classes at work and specimens of finished work. Among the latter were several photographs from the exhibition held at the Hall of the Board of Education, October 27. Mr. Griswold spoke of the problem confronting the teacher of shopwork on the lower East Side, as illustrated by some of the pictures.

The first topic of discussion, "Some Thoughts Concerning the Teaching of Constructive Design," was laid before the meeting by Professor Charles R. Richards, of Teachers College. Professor Richards spoke of the two phases of work in design — that which related to the fitness of the thing made for the purpose it was intended to serve, and that in which beauty of form and finish was involved — the one appealing to the reason and capable of being taught by rule, while the other appealed to the feelings and must be a matter of individual experience. The problem before the teacher was to determine how much might be taught by reasoning as to the fitness of the thing and how much must be left to the æsthetic sense. The speaker took occasion here to pay a tribute to the organization of the handwork in the public schools of New York city. In no other city, he said, had so much been accomplished, relatively, in the co-ordination of manual training and art in the school.

Mr. Harold H. Brown, speaking on this question, gave a brief résumé of the theories of Dr. Denman Ross regarding the principles of design.

Beauty in visible nature, and in design and representation is dependent on three principles, balance, rhythm, and harmony, expressed by means of tones, measures, and shapes. In the absence of all of these principles we have no beauty. The possibilities are infinite for the development of beauty along these lines, either singly or in combination.

The arts of language, music, and design are analogous in their dependence upon certain basic, grammatical laws peculiar to each. By these laws correct expression may be taught, and in language and music have long been taught, the subtle, personal qualities of poetry and feeling being in nowise hampered by these principles of order. If one accepts these principles, it will appear that the problem of teaching design is no longer one of a blind groping by "feeling" alone.

Mr. Hugo Froelich exhibited a number of specimens of applied design executed at Pratt Institute. These comprised work in embossed and painted leather, forged iron, hammered brass, pottery, etc. Mr. Froelich said that motives for decoration might be taken from nature, from historic forms, or from pure imagination. Some Japanese paintings were shown illustrating beauty of line and harmony of color. Historic ornament afforded limited scope for originality. More freedom was to be found in motives from nature, and Indian and other symbolic forms. Much thought

was demanded in the construction of good decorative designs. This tended to the development of mind which should be the main object of this work in the school.

Professor Churchill, of Teachers College, said that the idea of decorative design involved two thoughts: First, function and material dictate the form to a remarkable extent; second, form is modified through artistic feeling. In the latter are two elements: the emphasis of the structure and the feeling for beauty.

Function comes first. The form and decoration of any article should suggest what it is for. All art is based on reason and physical law, although in great masterpieces the elements are often so many and complex that analysis is impossible.

Professor Churchill gave a practical illustration of the points made by favorable criticism of several of the models exhibited and, in one or two cases, adverse criticism.

Mr. Peyser held that there was a basis of reason in every art. The form of an article should be suited to its function, and the decoration should be in harmony with the form. Children should be taught to use reasonable designs for decoration and let the feeling for beauty come afterward.

In summing up the discussion of this question Professor Richards pointed out that law is based on experience. Such rules of design as we have are the result of what we might term a consensus of feeling as to what is satisfactory and pleasing to the eye. All such expressions of common æsthetic feeling are helpful, but they are of more service in guarding against unpleasant results than in providing good ones. The law, such as it is, is in the seeing mind rather than in the world outside, and the danger of æsthetic rules is to use them dogmatically and impose them on everyone indifferently.

In an address on "Constructive Design in the Schools of Springfield" Mr. James Hall gave an interesting account of the finishing and furnishing of a reading-room in the State Street Grammar School in that city by some of the boys of the ninth grade. Designs for the construction of table, chairs, and bookcase were made and worked out by the boys in consultation with the teachers of drawing and manual training. Photographs of the completed furniture were shown. Mr. Hall pointed out that the beauty of a design did not depend upon abundance of ornament. He believed that in the prevailing enthusiam for the arts and crafts there was danger of over-decoration.

At the close of the meeting refreshments were served and members were afforded an opportunity for friendly conversation and a leisurely examination of the articles exhibited. The feeling was generally expressed that the meeting had been highly successful and had demonstrated the usefulness of the club.—W. F. VROOM.

NORTHWESTERN WISCONSIN TEACHERS' ASSOCIATION.

THE twelfth annual meeting of the Northwestern Wisconsin Teachers' Association was held at Menomonie, Friday and Saturday, October 24 and 25 respectively. Over seven hundred teachers were in attendance, making this session the largest in the history of the organization.

Friday forenoon the meeting of the general section occurred at the Mabel Tainter Memorial, where Senator J. H. Stout made the address of welcome, and State Superintendent L. D. Harvey spoke upon "What the Educational Ideals of Today Mean."

The afternoon was devoted to an inspection of the schools of the Central Building, including nine lower grades and the high school; the Stout Manual Training

School, in eight or more of its leading lines of work; the Kindergarten and Primary Training School for the preparation of teachers; the Stout School of Physical Culture; the Dunn County Training School for Teachers; and the Dunn County Agricultural School. All of these were in session, with the exception of the last-named school, the new building for which was not ready for occupancy. In the evening Dr. A. E. Winship delivered a lecture upon "Standards of Sympathy." The afternoon of Saturday was given over to meetings of the Rural-School Section, Graded-School Section, and High-School Section; also to listening to another lecture, by Dr. Winship, before the General Section upon the subject of "Character and Capacity."

At the general session Friday, Mrs. M. L. Coull, supervisor of kindergartens, Menomonie, read a paper entitled "Manual Training in Primary and Intermediate Grades." Mrs. Coull said that a seemingly unnecessary amount of nervous force is noticed in every young child. Much of it is used in the development of the body, and much in other ways. But in every case it must all be used up if the child is to be kept well, and the kindergarten has arranged a set of exercises that will properly turn a portion of this activity in the right direction.

The spirit of investigation also characterizes the child, and shows itself in the tearing of the doll or the bird's nest to pieces. Without this spirit of investigation man would have made little progress in civilization. Lead the child from the negative path of destruction to the positive path of construction. The kindergarten has long since worked out its problems along this line.

It remains for the primary school to work out its own problems, and in this working out manual training should be given an important place. The name "manual training," like the term "object lesson," has been misunderstood. It has called attention to the production of *things* more than to the production of *character*. But after many years of struggling the leaders of manual training have come to see that it must rest upon an educational basis, not upon an economic or utilitarian one.

There are four conditions necessary to the planning of all constructive work in the school: First, there must be a need for the thing made, and this need must be appreciated by the child. Second, there must be a social value to the article made. Third, the work must be varied in such a way as not to overtax the child's powers in any one direction. Fourth, the interest of the child in the things made must be so strong that it will lead him to a study of the materials themselves and the processes by which they were produced.

Mrs. Coull's paper closed with outlining the plan of work in Menomonie in the primary and intermediate grades.

"Manual Training in the Grammar Grades" was discussed by Mr. J. R. Forden, River Falls Normal School. He advocated that courses in manual training be so formulated that certain fundamental elements of subject-matter will be selected with reference to the nature of the kind of constructive work undertaken, rather than dictated by geography or history or some other subject. We should no more expect a writer of a text-book on manual training to go to physics for his subject-matter than we should a writer of a work on physics to outline his book from facts to be had in manual training. As to the constructive work of the grammar grades, it may take the form of experimental apparatus, conveniences, and aids about the school building, equipment of the manual-training laboratory, useful articles for the home, and gifts for friends. When the child has a sufficient amount of constructive knowledge, encourage him to create independently, and later he should take part in some community

work. Mr. Forden thought manual training of greatest value in the elementary school, and that less and less time should be devoted to it as advance is made through the grades.

In the meeting of the High-School Section, Superintendent D. E. Cameron, of Washburn, read a paper giving an account of the manual-training work in his town. He had been asked to take the topic, "What the Smaller High-Schools Do in Manual Training," but inasmuch as he thought such schools were doing very little in that line, and as his experience was limited to his own school, where manual training had been running only five months, he decided to present such topics as had interested him when introducing the work, together with facts showing the effect upon the boys, for as yet the girls had nothing along this line.

The manual-training movement began at the time when parents' meetings were held to discuss how the boys could be kept in school. It was then suggested that, if the schools would do work along practical lines, it would probably have the effect sought. Manual training was suggested among other things, and the school board requested that meetings be called to discuss the advisability of its introduction. Information regarding this form of training was furnished by Chicago, Milwaukee, West Superior, and Menomonie schools, and the decision was arrived at to give manual training a trial. The cost of the equipment last year amounted to only $280. The work has been extended from the high school into the eighth, seventh, and sixth grades, sixty boys in all taking it. The grade boys had one-half hour daily, while the period for the high-school boys is forty-five minutes.

This manual training is extra for the boys, and does not impair their studies, as their teachers testify. Superintendent Cameron believes the work so valuable that any small beginning that can be made toward establishing it should be accepted, for additions will come much more easily than the original. Parents soon come to see the value of manual training and will not willingly let it be dropped from the course. As a general proposition, people have what they really want. They do not know that they want this work until it has been forcibly brought to their attention. So it becomes the duty of the teacher as a leader in educational advancement to bring the matter before them in a way to appeal to their understanding. Then ask for a small fund for trial, and enter into the work with spirit and a determination to succeed.

Superintendent J. E. Hoyt was on the program to discuss Superintendent Cameron's paper, but thought best not to take up the time of the meeting as information was lacking as to what the smaller high schools of the state really did in manual training lines. Mr. Hoyt gave it as his opinion that it is important to educate the average taxpayer up to the point where the true value of manual training will appeal to him.

It may be of interest to know that in the Dunn County School of Agriculture (the first of its kind to be established in America) manual training has been provided for both boys and girls. The former are given instruction in farm carpentry and rural building; also in blacksmithing as applicable to work on a farm. The girls' course includes sewing, cooking, home economy and management.

JOHN H. MASON.

BOSTON MANUAL TRAINING CLUB.

AT the annual election of officers of the Manual Training Club of Boston, held October 4, the following were elected: president, George F. Hatch, of the Eliot

School; vice-president, Mr. George E. Houghton, director of manual training in Natick; treasurer, Mr. Pehr Nilsson, director of manual training, grammar grades, Waltham; librarian, Mr. Clarence M. Hunt, director of manual training, Milton.

At the November meeting Mr. Hunt read a paper on the use of raffia as a form of elementary manual training. In the Milton schools the raffia work is given to both boys and girls during the first half of the fourth grade. It is desirable because it is inexpensive, gives good eye-training, and does not call for accurate measuring. No tools are needed except rules and scissors, which most schoolrooms already possess, and large darning needles. Two pounds of raffia, costing from ten to twenty cents a pound, according to the quantities used, should be enough to allow each child of a class of fifty to make twelve or fourteen models. Raffia is the name given to a species of palm found largely in South America and Africa. The trunk of the tree is quite short, growing rarely over twelve feet in height, but from the top of the trunk leaves shoot out almost perpendicularly, to the height of forty or more feet. The foot-stalks of these leaves are often twelve to fifteen feet long and four or five inches in diameter. The skin of these foot-stalks is thin and extremely hard and tough. It is from this that we obtain our raffia. It is used commercially by market gardeners to tie up small vegetables, and is sold by seedsmen in twists or hanks varying in size from one to five pounds.

Mr. Brodhead read a paper on Venetian or bent iron. This work is suited to a short course just preceding the woodwork commonly given in the seventh grade. It is still better not to have any course at all, and use the material in connection with the woodwork. All designs would preferably be the work of the pupils. No forming machines should be used to secure the curves. The stock comes in three widths, with binders to match—three-sixteenths, one-quarter, and three-eighths of an inch. The first size can be handled by pupils as young as nine years old. The only tools used are flat and round-nosed pincers, and a pair of dividers to measure curves. The work, when finished, may be painted black or treated with gilt or aluminum. It may be attached to wood by double-pointed tacks or round-head screws. In the last event, a drill will be necessary. A prick punch should be used to start the hole. A twist drill with square shank may be used in an ordinary bit-stock, but, to prevent pressure from breaking the bit, it should be run through a block of hard wood a little shorter than the shank. Oil should be used while drilling. The chief value of the work lies in introducing a new material, working with flexible curves, and the correlation of the design and constructive effort. It was suggested that it would be desirable for every boy to have a little work in sewing and cooking, and for every girl to have a taste of woodworking, etc.

Before the December gathering, Mr. Frank M. Leavitt, principal of manual training in the Boston schools, read a paper on the use of cardboard as a form of elementary manual training. While the speaker believes in a diversified manual training it is necessary, in Boston, to use cardboard as a medium during the fourth, fifth, and sixth grades. It is a valuable form of manual training, being easily worked, inexpensive, and requiring few tools. The colored stock adds interest to the work. In the fourth grade no attempt should be made to have the children make mechanical drawings. They can get a good deal of its meaning from the blackboard, if the instructor makes careful drawings thereon. Through the fifth grade, drawing can be judiciously introduced, and pupils may be allowed to vary the outlines of and suggest decoration for the models. In the sixth grade quite a change is made in the manner

of presenting the subject. During the first half-year regular polyhedrons and some rather difficult models are shown in the finished state, and the pupils are required first to study what the development of a model would be and then make a working drawing of it, the teacher supplying measurements as requested. The pupils then construct the objects from their own drawings. During the last half of the year the children are encouraged to work out original projects. This requires a broad teacher and means a little more work, but the results are very satisfactory. Most of the problems that meet the sheet-metal worker or structural-steel man can be duplicated in cardboard. The work is capable of a close correlation with the daily work of the grade along other lines.—JOHN C. BRODHEAD.

BREVITIES.

"THE so-called fads in municipal schools are in my opinion the most fundamental power in the development of the modern American boy or girl."—Said in Chicago by PRESIDENT BUTLER of Columbia University.

BINGHAMTON, N. Y., is making substantial progress in manual training and domestic science. Besides the work at the Barlow School of Industrial Arts, which is in the closest co-operation with the public schools, classes in manual training are being conducted in connection with the Susquehanna Valley Home for Poor Children, and several of the churches in the city. Mechanical and architectural drawing is being taught at the Young Men's Christian Association and cooking in the course for trained nurses at the city hospital; also at the Young Women's Christian Association. Just now much interest is manifested in the relation of art to manual training.

NEW YORK CITY.

AN exhibition illustrating the more important features of the scheme of manual work as at present carried out in the public schools of this city, was held at the hall of the Board of Education during the week ending November 1, 1902.

The woodwork exhibited embraced only the principal models from each grade, not including any of the preparatory exercises. These models are worked out by the pupils from a type form prepared by the workshop instructor, the boys making the working drawing, original modification of outline, and original design for decoration in colors under the direction of the class teacher before and during the process of construction.

Some thirty schools having workshops were represented, each contributing a number of selected models from each of the five upper grades. The models made by the grades respectively were as follows: 5B, match-box—outline of back modified and color design painted on box; 6A, bracket shelf—back modified in outline and decorated; 6B, bookrack—end modified and decorated; 7A, box—modified in size and proportions and design applied to top and sides; 7B, bookcase—ends modified and decorated.

Besides these were exhibits from girls' schools, showing original work in embroidery and color design; match-boxes, glove-boxes, envelope holders, etc., in thin wood, and miscellaneous articles made in school or at home.

This exhibition was a tangible demonstration of the correlation of manual train-

ing and art education in the school, at the same time showing that, even in the large classes of our city schools, the initiative of the pupil may be advantageously exercised. The work in general received much favorable comment from visitors.

THE Department of Manual Training at Teachers College has this year much the largest class in its history. The class is not only large in numbers, but is composed of exceptional material, the majority of students being manual-training teachers with many years of experience, and in several cases of wide reputation, the two "war horses" of California being among the number. Eighty-six students are registered in the course in handwork for the lower grades.

THE Manhattan Trade School for Girls was opened early in November at 233 West Fourteenth street, under the direction of Mrs. Mary Schenck Woolman, professor of domestic art at Teachers College. A more extended account of this school will be given in a future issue.—W. F. VROOM.

NEWARK, N. J.

BEGINNING with November 1, all the girls in the fifth year, who, up to this time, have taken the regular knife-work with the boys, will be given sewing. The sewing will be taught by the regular class-room instructor, while the manual training is being given by a visiting special teacher.

IN all grades the work in applied design is being emphasized. Mr. James Hall, our new supervisor of drawing, is working conjointly with the director of manual training for the furtherance of this thought.

MANUAL-TRAINING classes have been organized in two of our public evening schools and are being taught by regular day-school manual-training teachers. For the present the work will be such as may be done in the regular classroom with the knife and simple tools. Individual design both constructive and decorative is to be accented.—ELI PICKWICK, JR.

BOSTON.

THE school committee has improved the status of the Boston manual-training teachers by creating a new grade, officially known as "instructor in woodworking," which carries with it an increase of pay to those appointed to it. Those first appointed to such positions were teachers with already increased responsibilities, or harder conditions of service. The appointees are Messrs. Edward C. Emerson, of the Bigelow School, George F. Hatch, of the Eliot and West Roxbury High Schools, Alexander Miller, of the Bennett and Brighton High Schools, Miss Celia B. Hallstrom, of the Dwight School, and Miss Mary E. Pierce, of the Appleton Street School.

MISS Lillian Beckwith has been appointed to service for the city, and is located at the Bigelow and Rice Training Schools.—JOHN C. BRODHEAD.

CANADA.

A TRAINING course for teachers was opened January 5, 1903, at Truro, Nova Scotia, under the direction of Mr. T. B. Kidner. The course will last six months and will consist of drawing, benchwork in wood, theory of manual training, and observation and practice teaching. No fees are to be charged for tuition, materials, or tools, the school being supported from the Macdonald manual-training fund. "Candidates for admission must have received normal-school training or produce satisfactory evi-

dence of at least one year's experience in successful teaching; age to be not under twenty years, and evidence as to good character and general fitness for training to be furnished."

CONCERNING the demand for teachers the leaflet describing this course says: "In the province of Nova Scotia the liberal grant offered by the government to school sections establishing departments of manual training is creating a demand for duly qualified teachers. In New Brunswick similar grants have been offered by the act passed last session, and it is anticipated that the subject will be taken up in many of the towns of that province in the near future. In Prince Edward Island the subject is also spreading steadily."

TENNESSEE.

THE Nashville public schools now have manual training in all the grades of the elementary school and in the high school.

THE results of the summer courses at Peabody Normal College and the University of Tennessee are beginning to manifest themselves. Many schools in the South are beginning work in manual training, and many more are asking for information concerning expense, materials, etc. Mrs. Ida Hood Clark, who taught the course for teachers of elementary grades in the schools above mentioned, writes that most of these inquiries for information come from the rural schools. Two cities in Tennessee, however, Jackson and Knoxville, have begun manual training in the first six grades.

CALIFORNIA.

MR. CREE T. WORK, supervisor of manual training in San Francisco, has resigned his position to accept the directorship of a state industrial school at Austin, Texas.

THE Pacific Manual Training Association held its November meeting at Los Angeles on the first day of the month. "Correlation" was discussed by Miss Virginia Pease and Miss Hattie Gower. Miss O'Kane spoke of the art school at Ipswich, Mass., telling how much the pupils have to depend upon their own efforts, even to gathering their clay for pottery and their grasses for basketry. Mr. J. H. Francis, of the Los Angeles Commercial High School, called attention to the trend of modern education toward the practical. "To lead the boy from something he knows and can do to something he does not know and cannot now do is education." Mr. C. A. Kunou gave an address on the subject, "In Essentials, Unity; in Non-Essentials, Liberty; in All Things, Charity," applying it to the organization and teaching of manual training. Miss Mary F. Ledyard spoke of "Industrial Education at Deerfield and Other Eastern Points." The closing address was given by Superintendent Foshay, of Los Angeles, in which he emphasized the necessity of teaching the child to see the good in life that is not bounded by the dollar.

MINNESOTA.

AFTER a short illness, Mr. John C. Billings died in Minneapolis, Minn., November 24, 1902. Mr. Billings came to Minneapolis five years ago to take up the work of manual training in the East High School. Five years he labored incessantly to lift the department to the high level of his ideal. He watched its growth from small beginnings to one of the best-equipped and best-managed industrial schools in the Northwest.

Rejoicing in what had been done, he still saw visions of higher and better things in the future. These ideas he communicated to his pupils, and they loved to work with him; for they recognized in him a master, and they felt that he was just. No day was too long for him; and no task was unconquerable. He was a man who did things. And the story of his short life is full of successful achievement. Broad culture and delicate refinement, a brain that conceived ideas, and stout courage to maintain them, a pure heart and spotless integrity, united in Mr. Billings to make a man — a true, honest, manly man. His life was a sweet force; his memory is a beautiful inspiration.— W. F. WEBSTER, *Principal East High School, Minneapolis.*

DAYTON, O.

DAYTON has a full-fledged Arts and Crafts Society, which is in a most flourishing condition, and is affiliated with the national movement in arts and crafts. Classes in composition and design, and the various crafts, are in progress under Mr. Forest E. Mann, from Pratt Institute.

AT the last meeting of the Western Ohio Superintendents' Round Table, held in Dayton, November 26, 27, and 28, one of the main topics for discussion was manual training. It was gratifying to see the spirit shown; all came to discuss "how" rather than "why," and much interest was shown. Information as to methods of procedure, cost of equipment, teachers, etc., etc., was sought, and to one who attended the meeting it looked as if every city and town in this section would soon have some form of manual training in full operation.

DAYTON has suffered a severe loss in the retirement of Dr. W. N. Hailmann, who leaves to take charge of the editorial department of the C. C. Birchard Publishing Co. of Boston. The loss is especially felt in the departments of manual training and the kindergarten.

His thorough sympathy with, his strong interest in, and his splendid knowledge of what these departments should be, did much to lighten the usual burdens of those connected with the departments, and much toward making them an integral part of the school system, instead of isolated parts as they were when he found them.

It is safe to say that the retirement of Dr. Hailmann is due entirely to the harassment of petty politicians and it is but another example of some of our foremost educators leaving public-school work on this account.—E. A. BENDING.

INDIANA.

OUTSIDE of Indianapolis with its well-established and excellent manual-training high school, and the work well started in the grades, also Richmond, we had not heard much of the spirit of manual training in Indiana until this year. Now one of the finest manual-training high schools in the country is being built at Fort Wayne. We hear murmurs of agitation at educational meetings and positive evidence of work being done at Huntington, Rushville, La Porte, and the Howe Military Institute at Lima.

THE Northern Indiana Teachers' Association, which has the largest actual enrolment and attendance of any teachers' organization outside the National Educational Association, will bring before the next meeting at Richmond, in March, the subject of manual training and give it a very prominent place on the program. An effort is being made to secure President Charles F. Thwing of the Western Reserve University to present and popularize this subject.—E. A. BENDING.

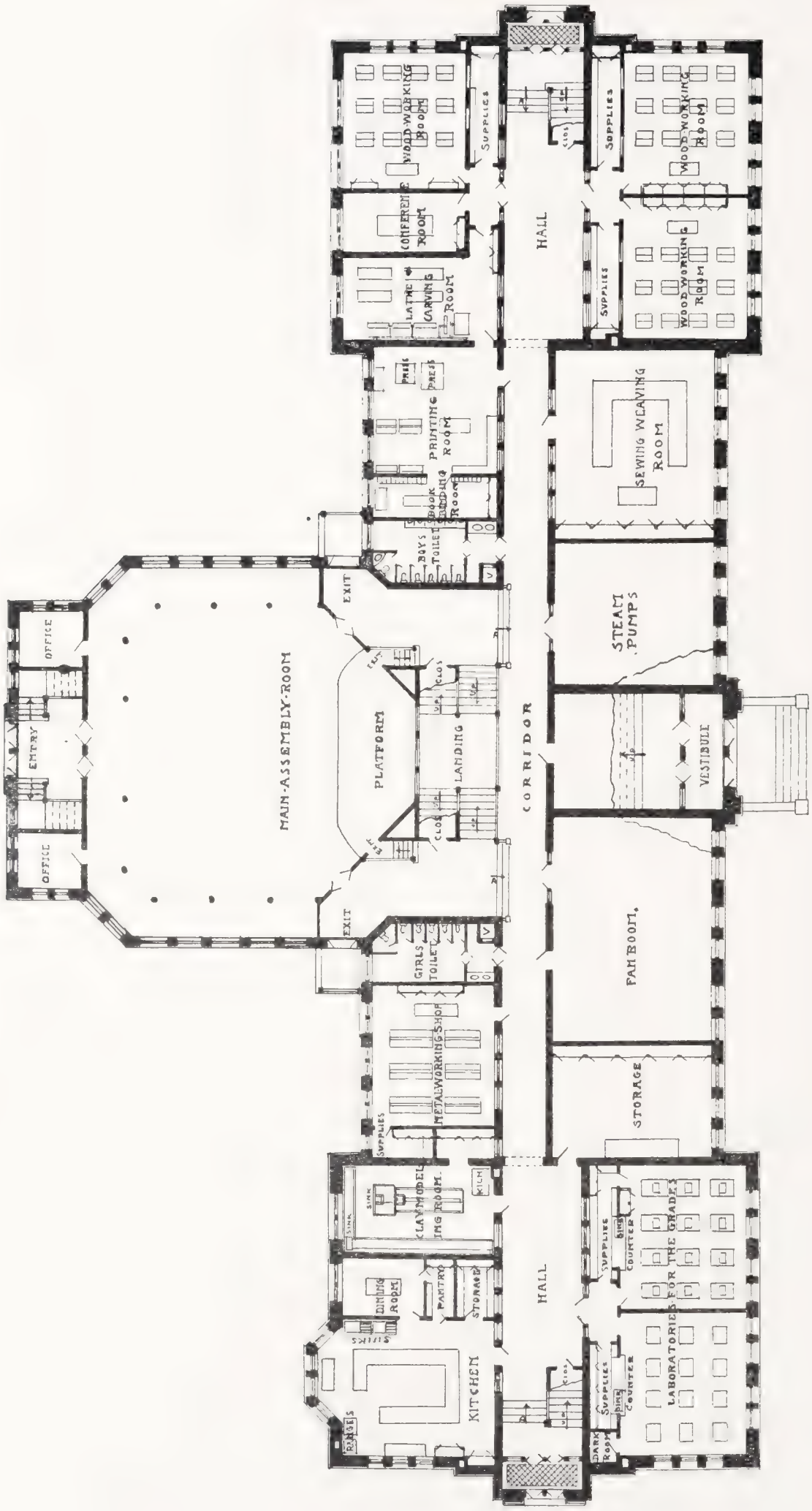
CHICAGO.

ANYONE who is at all interested in evening class work should make a careful study of the work being done at Lewis Institute. Located on the west side in the thickly populated district, this school probably has as fine a field for evening work as can be found in the United States, and, what is better, it is making the most of its opportunities. At present there are over one thousand students in regular evening classes. The courses are so arranged as to make it possible for a student to take one course, attending two evenings a week, or two courses, attending four evenings a week. The cost of tuition for one course for a term of ten weeks is five dollars. The following list of courses and the number of students in each course suggests the scope and magnitude of the work: mechanical drawing, five sections, 100; advanced mechanical drawing, 20; machine sketching, 15; machine design, 20; pattern-making and woodworking, 20: forge practice and tempering, 15; foundry and cupola practice, 14; machine-shop practice, 32; engineering principles and practical mathematics, 100; engineering mathematics, 10; strength of materials and statics, 10; structural steel work, 10; electrical engineering laboratory, 50; alternating current machinery, 30; street-railway practice, 8; steam engineering laboratory, 10; elementary practical steam engineering, 10; advanced practical steam engineering, 12; gas-engine practice, 5; general chemistry, 30; analytical chemistry, 20; architectural sculpture, 10; elementary English grammar and composition, 40; advanced English grammar and composition, 40; advanced English composition, 10; English literature, 10; elementary Latin, 5; advanced Latin, 5; French, 15; German, 20; Spanish, 20; arithmetic, 35; elementary algebra, 25; advanced algebra, 10; geometry, 10; trigonometry, 10; penmanship, 30; accounting, 30; cookery, 20; physical culture, 150; Thursday evening lecture course, twelve lectures on physiography, 160, to be followed by six on literature and six on history.

REALIZING the importance of the normal school as the heart of the city-school system, the board of education has made provision for the erection of two new buildings upon the site of the old normal. They are to be the educational home of those graduates of the Chicago high schools who wish to make teaching their profession. In its new environment the school will be known as Chicago Teachers' College. A feature of the school will be the opportunity it affords for practical work.

The main building, ground for which will be broken early in 1903, is to be four stories in height, with a frontage of 185 feet by a depth of 236 feet, and is designed to accommodate 1,600 students. Not only has special attention been given to the requirements of the college in the matter of auditorium, assembly, study-hall, library, class-rooms, and offices, but a detailed study has been made of the plans and equipment both for the laboratories of science and geography, and for the class-rooms and shops of the departments of art and manual training, including drafting, modeling, and wood-carving rooms to be used in common by the two departments. The shops provide for work in wood, metal, and clay, and for weaving, sewing, cooking, printing, and bookbinding.

Adjoining the main building is the practice school, fast approaching completion. It is four stories in height, 286 feet frontage by 100 feet in depth, and planned to accommodate 1,200 children ranging from the kindergarten through all the grades. A feature of the practice school is the opportunity afforded for constructive work, an entire floor being devoted to shops equipped for work in cardboard, weaving, cooking, clay-



GROUND-PLAN-OF-NORMAL-PRACTICE-SCHOOL
(TO-BE-COMPLETED-IN-1902)
SHOWING-ARRANGEMENT-OF-ROOMS-DEVOTED-TO
DEPARTMENT-OF-MANUAL-TRAINING.

modeling, printing, metal, and wood, as well as elementary work in chemistry and physics. Certain of the schoolrooms also are equipped for constructive work.

In April, 1901, the department of manual training was organized at the normal. Laboratory work and shopwork are now required of all students. The work of the department is twofold:

1. To provide (*a*) an elementary course for students who, in addition to the regular instruction given in the shops in the main building, desire practical experience in teaching in the practice school. Here consideration is given those forms of work specially adaptable to the first five grades, including problems in cardboard, clay, raffia, reeds, metal, and wood. The practice teacher experienced in the simple equipment and acquainted with the problem will be ready to meet conditions in the city schools where the schoolroom must usually serve as shop and the grade teacher direct the work. To provide (*b*) an advanced course for those students wishing to gain technical shop experience beyond the elementary course, including the upper grades in the practice school, so as to be prepared to conduct the grammar grade shops in the city schools.

2. To provide suggestive outlines of work for the normal-school extension course organized in September, 1902, and take charge of classes of grade teachers at centers in different parts of the city. This work enables the teachers in the grades to enjoy the same privileges as the normal students in the matter of elementary and advanced courses in construction.

In the class of 1902 at the normal, 120 students took the elementary course and 10 the advanced work. In the normal-school extension course, 512 grade teachers are taking the elementary work.— Oscar L. McMurry.

PEORIA.

The Basketry Guild was exceptionally fortunate in its November meeting. The speaker on that occasion was Miss Clara I. Mitchell, of the School of Education, University of Chicago, who gave a delightfully informal talk on "Color and Dyeing in Basketry." Miss Mitchell illustrated her talk with a collection of baskets, among which were several made in Deerfield, Mass. She prefaced her talk with a plea for the recognition of the value of handicraft as a factor in art and in education, and then told the members of the guild how to use the "indigo pot" and other vegetable processes in coloring their basketry material.

At the suggestion of Mr. Clinton S. Van Deusen, the metric system of measurements has been adopted at Bradley Polytechnic Institute in first-year classes in woodworking and drawing. The reason for this action is obvious to those who have had anything to do with the metric system in the study of physics or in advanced work in science. Daily practice with a metric rule for even a few months will give one a confidence in the use of the system that cannot be gained in the time ordinarily devoted to such measurements in a physics laboratory. Then, too, there is particular interest in the use of the metric system at this time when much is being said about its general adoption.

MENOMONIE, WIS.

That there should be close sympathy between the school and the home goes almost without the saying. Such a bond generally exists when parents visit the schools often and informally, see their children in recitation-room and shop, and

become acquainted with the teachers. Visitation like this is helpful alike to the teachers and the taught, and in the community gives rise to a readier understanding and appreciation of the problems and needs of the public schools.

How to bring about in greater measure such a desirable state of affairs has for some time been engaging the attention of the school board and the teachers of Menomonie, Wis., and this has at last resulted in the formation of a club, including teachers and members of the board, organized with the express purpose of promoting active public interest in the work and aims of the city schools.

The inception of the idea is due to Senator J. H. Stout, president of the school board, who early last October called the teachers together and presented his views upon the subject. The sentiment of the meeting appeared unanimous that something along the lines indicated by Senator Stout was most desirable and should be attempted, besides which, the getting together in this way of the school board and the teachers could not prove other than beneficial educationally and socially.

Thus far the club has held three meetings, one each month, in the rooms of the department of domestic science, Stout Manual Training Building. The December meeting occurred on Monday, December 1, and, like the previous gatherings, was characterized by informality and sociability. The club was favored with the presence of Hon. L. D. Harvey, state superintendent of public instruction, who in a short address congratulated the organization upon its aims, and remarked that he knew of no other similar association of public-school teachers organized on the same basis. A report was then read of a committee previously appointed to make suggestions as to the best way to begin to induce the much-desired visiting of the schools by the people of the community; after which a musical program, followed by light refreshments, closed the evening.

THE building for the Dunn County School of Agriculture, Menomonie, is now completed, and sessions began in it November 14. This is the first, and so far the only, institution of the kind in the country. State Superintendent L. D. Harvey, acting as special commissioner appointed by the legislature, after a careful study of conditions in Europe and America, recommended the establishment of two such schools in Wisconsin, and outlined plans of their general character. A law embodying the substance of the superintendent's report was passed in 1901, and Dunn county was the first to organize under this law. The building and site cost $25,000, for which the county appropriated $2,000, the city council of Menomonie $1,500, citizens of Menomonie $1,000, and Senator Stout $2,500.

The school is principally intended for boys and girls from the country who have completed the work of the country schools. The course is very practical and covers a period of two years. In addition to the study of those subjects pertaining to scientific agriculture, the boys are given instruction in carpentry, blacksmithing, drawing, and the care and management of farm machinery; while the girls take cooking, sewing, home management, millinery, and drawing.

During this year the boys' work in manual training will be carried on in the Stout Manual Training School, the use of which has been donated by Senator Stout, who is chairman of the Board of Control of the Agricultural School. By another year it is expected that the county board of supervisors will appropriate $2,500 with which to fit up for manual-training purposes a large wooden building now owned by the school and on the same grounds with it.—JOHN H. MASON.

KANSAS CITY, MO.

THE Manual Training High School of Kansas City, Mo., in the sixth year of its existence has reached an enrolment of 1,700 students, and has a faculty of 57 teachers. This is one of four high schools in the city and contains more than half of the total high-school enrolment, which is about 3,200. The normal capacity of the building is for 1,000 students, and in order to accommodate the large numbers that applied for admission, the school day has been lengthened, and relay teachers employed.

As might be expected, the school has had a somewhat strenuous experience. Last year, in order to equalize the attendance between the high schools an attempt was made to take all foreign languages out of the curriculum. After a two-months' discussion, in which the press and the citizens at large participated, it was decided to retain the languages and leave the course as originally planned. The course is broad, containing a full academic curriculum correlated with a four-years' course in art, mechanical drawing, and manual training for both boys and girls. The enrolment of boys and of girls is about equal. It has been found that the student's academic accomplishment, instead of being lessened by the time used by manual training, as is commonly supposed, is actually increased and its quality considerably improved.

Some educational experiments have been undertaken by this school which may be of some interest. In general it may be said that the work in all the departments is, as far as possible, inductive and heuristic If there are rooms where this is not so, they are those of young teachers who have not grown out of the method in which they were taught in college. But all are trying and are fast adjusting themselves to the new atmosphere. The work in geometry, first given in the form of mimeograph notes, has crystallized into an inductive text-book by A. A. Dodd and B. T. Chace, teachers in the school. The old Euclidian plan of stating the proposition to be proved and then giving a proof ready-made has been reversed. The proposition is reached inductively by the student in answering questions arranged with a view to its development.

Another of the experiments now in progress is an attempt to individualize the work of the students and diminish the waste incident to the usual form of recitation. To this end the recitation periods are seventy minutes, instead of forty minutes, as is customary in high schools, and the classes in the various branches meet on alternate days. This plan gives time for laboratory work. The aim is to make the teacher a director of the students' work instead of a "recitation post." — GILBERT B. MORRISON.

ADDRESS OF PROFESSOR WOODWARD

AT THE LAYING OF THE CORNER STONE OF THE WILLIAM McKINLEY HIGH SCHOOL ST. LOUIS, MO., NOVEMBER 1, 1902.

I AM deeply grateful that I have lived to see this day, and that I am able to participate in these exercises. I see realized hopes that are twenty years old. Today the board of education, which well represents a vast majority of the intelligent and progressive men and women of this city, lays the corner-stone of a splendid new high school, which is to give secondary education to the graduates of our grammar schools in the southern half of the city. From want of this school the city has suffered both in reputation and in training and culture. The loss in education, which should be our chief cause of regret, has been insidious and not generally or keenly felt. The situation has been accepted and patiently endured. It is only by comparison with

other communities that we see that your children have not enjoyed the advantages to which, under the American system of public education, they are entitled. The children of Chicago on the average go to school a year longer than your children do; and in Boston, the school period is two years longer. This is largely due to their ample high-school facilities. It is our duty, as the administrators of the public schools, to make these facts known and to see to it that your children are secure in the enjoyment of their rightful privileges.

Our loss in reputation has been keenly felt. The city has been pointed out as conspicuously lacking in high-school attendance and high-school facilities, and we have had no good defense. We could not say that the city was deficient in wealth;

WILLIAM McKINLEY HIGH SCHOOL, ST. LOUIS.

that its citizens were lacking in educational experience; that we did not know what other large cities east and north were doing; or that the board of education was ignorant of the value of four years of training and study beyond the range of the traditional three R's.

None of those lines of defense was open to us. The best we could say was that there was no strong demand for high-school privileges, and that, even if the demand were strong, the income of the board under the existing constitutional limitation, was not sufficient. All the money the board had was needed for the primary and grammar grades, so that the building, equipping, and maintaining of new high schools was simply out of the question. The board has not been "stingy," as a distinguished educator has recently intimated; it has devoted to the schools every cent it could legally lay its hands on; it has husbanded its resources with the greatest care, and the taxpayers of the city may rest assured that during the last five years, at least, no money has been wasted.

In the face of this statement, you naturally ask how we have been able to buy this fine lot of ground, carefully mature the plans of this building, contract for its erection, and even carry the work forward to the present stage. Let me answer this reasonable question, and I ask you to give close heed to my answers:

In the first place, we have seen with increasing satisfaction the swelling ranks in the higher grades of the grammar schools, and the unprecedented numbers who are looking forward to high-school work. I count the duty of meeting the needs of these aspiring and ambitious youth as one of the most important duties of the board. We must do away with the custom, which has been too common, of permitting children to withdraw from school with the school course less than half completed. There is

no middle point (some people seem to think there is) where we can say a laboring man's child has had schooling enough. Nothing short of all that is offered is enough. Hence, we are doing our best to keep the children in school once they get there. So we are saving money for this high school, by postponing less urgent demands for reconstruction; by placing our new buildings just where the demand for room is the greatest; by redistricting the city so as to keep every building full to its maximum; by meeting scattered and unforeseen calls by portable one-room buildings, which can be taken down, drawn across the city, and set up in a day in a new locality. In these ways the board has gone forward, as you see, and the same policy, if continued, will in time complete and equip this building.

In the second place, the board counts upon an adequate income in the near future. Instead of a slow construction and a long-delayed opening of this school, we shall have a rapid completion and an early inauguration of the McKinley High School, if the fifth amendment to the state constitution is adopted by the voters of Missouri next Tuesday. That amendment will make it possible to levy six mills instead of four mills on a dollar valuation. You will not feel the difference in your taxes, but you will see a great difference in your schools.

When the board of education asked for that amendment, it had, along with many other important matters, this high school, and the James E. Yeatman High School in North St. Louis, in mind. It is proper that I should say this to you, and it is highly important that you should remember what I say.

Do you say we are counting our chickens too early? I doubt it. Should the amendment fail, the two high schools will go slowly on to completion, as money can from time to time be spared from other pressing needs. But away with all thought of failure. The amendment *must not fail.* Follow the advice of Richelieu, and scratch the word "fail" out of your dictionaries, and go to work and see to it that every parent, every high-school graduate, every taxpayer votes "yes" on Amendment 5.[1]

There is another and special reason why I rejoice today: This is to be

A MANUAL TRAINING HIGH SCHOOL.

That is a great triumph for sound, practical, all-around education. Manual training, as a feature of secondary education, started in St. Louis twenty-two years ago. Public-spirited citizens furnished the means for trying a novel experiment. It was proposed to combine manual with mental training; to put the liberal arts and the mechanic arts side by side into the same curriculum; to deal simultaneously with material forces and appliances, and with spiritual forces and appliances; to cultivate, not alone or chiefly the memory and the understanding, but the judgment and the executive faculties as well; to extend the humanities so as to include human life, human activities, and human needs as they exist now and here.

The experiment was watched with a lively interest by teachers and business-men far and near. Many wise and excellent educators had grave fears as to the results.

[1] Three days after this address was given the amendment was carried by a large majority. Under it in May, 1903, the board will levy a school tax of six mills on a dollar in the three cities of St. Louis, Kansas City, and St. Joseph. This marks an epoch in the cause of popular education in Missouri.

The McKinley high-school building is going rapidly forward and there is reasonable certainty that the school will be opened early in 1904. On November 23 the board of education let the contract for the erection of the "James E. Yeatman [Manual Training] High School" in northern St. Louis. These are practically twin schools, with equal appointments and accommodations. The latter will be ready for opening by September, 1904.

It was thought that the introduction of tools, materials, machinery, the theories of construction and technical drafting, might not only break up the orderly program of a school, but lower the intellectual and moral tone. One distinguished man said that the advocates of manual training were placing kegs of gunpowder under every public school in America. An editor predicted that the school would turn out "a degraded mass of operatives."

We now know that all such fears were groundless, and all such predictions were false. The conspicuous result has been that young men have brought to the ordinary duties and responsibilities of life an intellectual and manual grasp of actual conditions which has at once gained for them a clear advantage. They have shown that some mechanical skill and a great deal of mechanical comprehension have been valuable assets and not unfit accompaniments of refined tastes and good manners. The training has opened new avenues of usefulness to many a lad, and has enabled its beneficiaries to choose their occupations more wisely, either in the direction of the industrial arts or in other fields. Their success has been remarkable, and as a consequence manual-training schools, on public and on private foundations, have been established in every large city in the country.

The battle for manual training has been fought and won. As a recognized feature in the education of the average boy it has proved to be a better thing than was claimed for it in the beginning. The intellect has been sharpened by habits of close observation, and the mental analysis of complex processes. The passion for action, natural and proper for a healthy boy, has been turned into useful channels and away from harmful associations and destructive activities. Schools have become more attractive, and the attendance of boys and girls in the higher grades has perceptibly increased wherever manual training has been offered.

I say girls, as well as boys, for the thoughtful teachers of girls have devised for them, too, a kind and variety of manual training equally appropriate and equally attractive. No longer can it truthfully be said that the girls in the higher grades of our schools are not taught to be useful and helpful at home. If our young men are to be trained to be better home-builders, better providers, more generous givers, our young women must be trained to be better home-keepers and better housewives. So domestic science, household economics, and a rational study of art have entered into the course of study for girls. In every large city and in nearly every large town in this country, manual training and domestic science have been introduced side by side, and they are very popular.

In short, manual training has spread through the world. In every civilized community the American type of manual training has found a foothold. Europe was full, and is still full, of trade schools, where boys with a very short and narrow course of book study are trained in the practical work and petty details of special trades. A school for liberal and general culture, such as the William McKinley High School will be, is a very different thing; it is almost as much a novelty in Europe as a genuine trade school would be in St. Louis.

It is less than four years since, through the generous help of Mr. and Mrs. William Barr of New York, and a score of citizens of St. Louis, a beginning in the direction of manual training and domestic science in the public schools was made in this city. The start was made in the Columbia School. Every year since, the work has been maintained and extended. At present manual training and domestic science are given at eight centers, including the Sumner High, which is for the colored boys and

girls of the city. The number of seventh- and eighth-grade pupils who have received a regular lesson during the present week, omitting the Sumner, is 4,624. The value of what they get in thirty-six or thirty-eight lessons a year is great in many ways, as thousands of parents will testify.

In this high school both the toolwork and the drawing, on the one hand, and the study of the fine arts and the domestic arts, on the other, will rise to higher planes, increasing in quantity and deepening in quality. I shall not go into details as to the instruction to be given, or the appliances for giving it. It must suffice if I point to these massive and extensive foundations, and add that before the plans for this building were drawn, the board of education sent Superintendent Soldan and Commissioner Ittner on a tour of inspection through all the cities of the north and east, in order that they might bring to the task of designing this plant and arranging its courses of study the best and latest ideas in the land. This building and its appointments will stand, I am confident, a monument to the skill and good taste of our building commissioner, Mr. Ittner, and the mature judgment of Superintendent Soldan of the instruction department. The building is to have a general assembly-room, nineteen class-rooms, five laboratories, two large drawing- and art-rooms, and four shops and domestic-science rooms. It will easily accommodate 1,000 pupils. The style and quality of workmanship are to be in keeping with the dignity and resources of the great city of St. Louis. It is neither extravagant nor mean. The building and equipment will cost about $325,000. I trust we shall be able to dedicate it and open the school in 1904, during the great exposition. Our visitors must see that we know how to plan, and are able to erect good schoolhouses; that we can equip them with accomplished and efficient teachers, and withal fill them with bright, high-minded boys and girls.

My closing word is to the pupils, teachers, and parents of South St. Louis. This school is for you; all this money is spent for your benefit. Let no boy or girl now in school say: "The McKinley High School is not for me." Let no father say: "The new high school is not for my children." It *is* for you and for your children, and if you fail to take advantage of it, then just to that extent this enterprise will fail, and all this money and labor will have been spent in vain.

May this fine structure go on to completion without accident or delay. May pupils throng its recitation-rooms, laboratories, and workshops. As the years roll on and these foundations are covered with ivy, and the lofty walls are touched and mellowed with time, may thousands of noble men and women look back with love and pride to the "McKinley High" as the effective influence which lifted them to all the delights and rewards of a higher education.

EDITORIAL.

In another column we report President Harper's proposition with reference to the reorganization of the elementary and secondary schools in such a way as to give six years only to elementary-school work and six years to secondary work. In considering this proposition, we very naturally ask the question: What effect would this have upon manual training? If it were to mean crowding seven years of the present work into six, thus overloading these six, it would have the effect of keeping out work not already in and of crowding out some that is in. But it is clearly stated by those who believe in the plan that its purpose is not to overcrowd the six years, but, with clearly defined aims, to accomplish what is the legitimate work of the elementary school in that length of time. The carrying out of such a purpose should have no bad effect upon manual training. On the contrary, by sifting all the work it would be helping manual training to find its true place, not as an isolated subject, but as a vital part of the unified whole.

Apart from the work of the lower six grades every supervisor in a large city will see at once that this proposition solves one of his most perplexing problems—that of equipment for the work of the seventh and eighth years. At the present time the prevailing organization of manual training calls for special teachers of woodworking and cooking, and special equipments for the work of the seventh and eighth grades. This plan is out of harmony with the organization of other lines of elementary-school work and is often objected to on that account. Under the proposed plan all work above the sixth grade would belong to the secondary school, would presumably be done in buildings especially equipped for secondary-school work, and might all be done by special teachers, as is the case at the present time in large high schools. This would be favorable to manual training. Moreover, it would bring together the present eighth-grade work and the work of the early years of the high school, which would be a distinct advantage. The present break is often a disadvantage and, as a matter of fact, there is and should be more likeness between the eighth-grade work and that of the early high-school years than there is or should be between the sixth-grade work and that of the eighth. We believe that, if the pro-

posed plan is a good one, manual training will help in bringing about its adoption, for manual training in many school systems has started the organization of school work in the direction proposed. We shall watch with keen interest the discussion of Dr. Harper's proposition.

Dr. Woodward and the school officials of St. Louis are to be congratulated on their recent success in securing an additional two-mill tax. While this great result was brought about through a vigorous campaign, in which many persons, and especially the city school superintendent, took a prominent part, it certainly was a great personal victory for Dr. Woodward and a triumph for the principles he has advocated during the last twenty-five years. It must, indeed, be a source of gratification to him to see his untiring labors crowned with the degree of success that is now assured. Dr. Woodward did more than anyone else to start the manual-training movement which has swept over this country; yet his home city has seemed to be affected very little by the movement. His school in connection with Washington University has been popular, but the public schools have done very little in the way of manual training. Some of us had begun to fear that Dr. Woodward was another example of a prophet without honor in his own country, when we heard, in 1900, that he had not only been elected a member of the St. Louis board of education, but had been made its president. The duties of this office were performed by him in addition to those as dean of the School of Engineering of Washington University and director of the Manual Training School. His report as president of the board of education, submitted November 30, 1900, made it evident that a new and positive force was at work in school matters. He placed squarely before the people the demands upon the board and the need of increased resources. After reviewing in detail the salient points of the situation, he said that there should be no difference of opinion as to the duty of the board. "Neither kindergartens, nor physical culture, nor free books, nor manual training, nor fire-proof buildings should be cut off and abolished. Like everything else which is valuable, a good system of education costs a great deal of money." He then stated the specific purposes for which more money was needed, among which were manual training and domestic science in the grammar grades, and four new high schools, two of which should emphasize science and manual training. In making these recommendations he was speaking for a united board of education, and he had faith to believe that ultimate victory would be

theirs. Effort did not stop with the printing of the report; plans were perfected and steps taken toward the carrying out of the recommendations. Superintendent Soldan's efforts in this direction were seconded. Last election day brought a splendid popular victory, and a new era has dawned in St. Louis. On pp. 111 to 115 we publish Dr. Woodward's address at the laying of the corner-stone of the William McKinley High School, the first of the two great manual-training high schools recommended in Dr. Woodward's report.

THE resignation of School Superintendent Charles B. Gilbert, of Rochester, N. Y., to become the manager of the educational department of D. Appleton & Co., is a great loss to the interest of public-school administration in America, and an especial loss to the cause of manual training. In our estimation, no other school superintendent has done so much to put into practice modern theories with reference to the newer subjects of the curriculum as has Mr. Gilbert in St. Paul, in Newark, and in Rochester. He is a man of action. While other men are waiting for public opinion to shape itself—to adjust itself to modern philosophy—Mr. Gilbert molds public opinion, inspires his teachers, and actually accomplishes the results that others are dreaming about. In the words of the *School Journal*, "he has twice demonstrated, under peculiarly difficult conditions, his remarkable power of transforming a large system of public instruction, so that from the kindergarten through the high school his convictions are seen at work." From the size of the salary offered Mr. Gilbert, it is obvious that D. Appleton & Co. realize that they have engaged a valuable man, and it is gratifying to learn that the school board and the people of Rochester also appreciate his worth and will sincerely regret his leaving. His place will be taken by Dr. Edward R. Shaw, dean of the School of Pedagogy of the New York University.

WE are pleased to learn that Porto Rico is planning a system of industrial training adequate to its needs. Nothing can be of greater importance to the future industrial development of the island than a system of public education suited to its own needs. To be such it must contain a large element that we call industrial. We understand that Dr. Lindsay, commissioner of education of the island, is planning to establish manual training in connection with the high school at San Juan; also to place it in the lower grades in the principal towns. This is encouraging, but in beginning work that is so far-reaching in its

results it is important that the whole industrial, educational, and social problem be considered with a view to present conditions, on the one hand, and, on the other, to the highest future which, in a natural course of events, will be possible for the island. Porto Rico is not like New York state or Massachusetts, consequently its system of industrial training should not be exactly like that in these states. It is, therefore, of greatest importance that the first supervisor of industrial training have a broad experience, high ideals, sympathy with people as he finds them, and tact and originality and force in his efforts to elevate. It was, therefore, no slight compliment that was paid to Mr. Arthur D. Dean, of the Mechanic Arts High School of Springfield, Mass., when a few weeks ago he was asked to leave his present position to become the supervisor of industrial training in Porto Rico.

At first Mr. Dean did not look with favor upon such a change, but since then he has been induced to go to Porto Rico to look over the ground, taking about a month for the trip, after which he will announce his decision. Mr. Dean was the first enrolled student of the Ringe School in Cambridge, Mass. After graduating there he went to the Massachusetts Institute of Technology in Boston, where he graduated with high rank in 1895. Having already given some thought to the educational side of handwork, he decided to devote his life to manual-training school work. His first position as teacher was in Portland, Me., where he organized manual training in a public school. After two years he was called to Malden, Mass., to organize similar work there in connection with the high school. Since 1898 he has been Principal Warner's right-hand man in the development of the Mechanic Arts High School in Springfield, having taught a variety of subjects, including mathematics and science, and organized new departments in the school. As is well known to readers of this MAGAZINE, Mr. Dean has been especially interested in the development of the trade-instruction department. Manual-training teachers throughout the country will await with interest any report Mr. Dean may make of what he finds in Porto Rico, and his final decision with reference to the supervisorship.

REVIEWS.

FOREIGN REVIEWS.

By J. H. Trybom.

ZILLER'S TECHNICAL WORK.

The old controversy between the Froebelian and the Herbartian theories of education is placed before us again by a review in the October and November numbers of the *Blätter für Knaben-Handarbeit.* Herr Emil Zeissig, of Annaberg, is writing a series of continuous articles on Ziller's *Technische Arbeit.*

Mr. M. E. Sadler's views on the manual-training aspect of this controversy are rather interesting, and a few extracts from his *Report on Manual Training in Foreign Countries* may have explanatory value. Mr. Sadler is the director of the Special Inquiry Section to the Council of Education of the city of London. His pamphlet on this subject was published in 1897. He writes as follows:

> The writings of Herbart are specially noteworthy as counteracting the tendency to treat manual training as if it were no organic part of the curriculum. As far as it goes, the influence of the Froebelian movement has been in the same direction, but the views of the two schools as to the place of manual training in education are far from being identical. As Herr Rissmann points out, Froebel and Herbart both insist on the necessary connection between handwork and other lessons of the school. But, according to Froebel, hand-training is the foundation which must precede all formal training of the understanding. According to the school of Herbart, on the other hand, formal instruction of other kinds is the matter of chief concern, while hand-training, though it should be intimately connected with the rest of the curriculum, is to be treated as a means of applying what has been otherwise learned. And this difference of opinion is a fundamental one, though the two views have not yet often come into conflict, owing to the fact that the Froebelian movement has chiefly influenced the schools for very young children, while the Herbartian has hitherto, for the most part, affected the curriculum of secondary schools. There are many signs, however, that the Herbartian doctrines have spread widely among those concerned with the earlier stages of education, and that a conflict of principles which will affect the whole work of the kindergarten has already begun.

This paragraph is interesting, coming as it does from an English authority on educational thought.

As Mr. Sadler says, both Froebel and Herbart insist upon a close correlation between manual training and the other studies. But how

to secure this intimacy of educational connection is still a subject of discussion and inquiry even among the Herbartian writers, who agree as to the principle. Herbart himself did not work the matter out in detail, though he left no doubt as to his opinion on the matter of principle. Thus in his *Sketch of Educational Lectures* he wrote: "Everybody ought to learn to use his hands." After speech the hand has the place of honor as distinguishing man from beast. "There should be manual-training classes connected with elementary schools, but these have no business to be trade schools directly preparing boys for industry." Among Herbart's followers Ziller, Barth, and Willmann elucidated the theory of manual-training instruction, while, among recent writers of the same school of educational thought, Dr. O. W. Beyer, in his article on *Handarbeit der Knaben* in Professor Rein's *Encyclopedisches Handbuch der Pedagogik*, Vol. III, pp. 249–79, has sketched an elaborate plan for connecting manual training with the various subjects and stages of school life. Also the report of Rector Scholz on the proceedings of Dr. Rein's Educational Seminar at Jena in 1889–90, contains a careful discussion of the principles on which manual training may be associated with various subjects in the curriculum, especially with history and literature.

Ziller is considered one of the foremost expounders of the Herbartian doctrine in Germany. Herr Zeissig has made a careful study of all his works, and he gives in the German manual-training magazine a most systematically arranged treatise on Ziller's *Technische Arbeit*. A few quotations will be all that space permits:

> No teacher of manual training can afford to omit a study of Ziller's works. He deserves much credit for having correlated manual training and the other studies, and made handwork a necessary part of a liberal education. Before Ziller handwork was recommended mostly for its purely technical and industrial benefits to the student. Ziller brought about a change in this attitude toward manual training, but nevertheless some passages in his writings seem to indicate that the former aspect continued to influence him somewhat. . . . . All production is chiefly an activity of the mind. If this mental activity is not correlated with past presentations within the same field of activity or related fields, the mind of the child is only partly active; it is not *konzentriert*. It is a case similar to teaching drawing and writing by simply copying. So it is always when the doing is not carefully founded upon such knowledge possessed by the pupil, as relates to the activity in question. Therefore a thorough, many-sided study and discussion of an object should take place before the making. . . . . All discussions of a technical and more general nature should precede the making of the model. . . . . No object should be made without a thorough previous discussion of material, tools, the form of the object and its use, or without a previous sketch and complete working drawing, except in cases where the items are all so familiar as to render discussion superfluous. . . . . To copy an object without previous

discussion is to do a thing blindly. Such a procedure wastes time, material, etc. . . . . Unfortunately there continually reappear of late believers in the Froebelian doctrine first to do, then to think. [Herr Zeissig takes exception to this stricture, and quotes several passages from Ziller's work in which Ziller himself takes the same attitude as Froebel.]

In regard to the indirect advantages of manual training, Ziller's work contains the following:

The manual occupations are chiefly of value for their development of the hand, however much they may contribute to the training of the eye and the æsthetic sense. . . . . The hand deserves above all such an education, as the mind depends for its development just as much upon the hand as upon the senses. . . . . Is not the difference between man and the animal essentially based upon speech and the power of the hand? . . . . From the mental superiority of man his moral-religious life is developed. It is therefore Froebel's great merit that, recognizing the influence of the education of the hand upon the development of the higher moral-religious life, he has taken up and continued the efforts of the "Philanthropists" for technical work. We must condone his false theory of psychology and education, as he has certainly introduced excellent exercises for the training of the hand, and they afford at the same time an easy transition to art. . . . . The manual exercises, having this broad culturing influence, will form a direct preparation for broad living. . . . . In accordance with its content, manual training, like drawing, can never be considered an independent subject (*"kann niemals auf eigenen Füssen stehen"*). . . . . They must continually serve the other subjects, that is, be closely correlated with them. . . . . The lessons on sense-training, nature studies, mathematics, language, history, geography, drawing, and singing — all these subjects should give problems to be solved in the manual-training room. . . . . Geometry is closely related to constructive work. . . . . Nature studies, above all others, should go hand in hand with manual training.

BOOKS.

Hand-Loom Weaving. By Mattie Phipps Todd. Rand, McNally & Co., Chicago, 1902. 5×7 in.; pp. 120; price, $0.90.—The title, "Hand-Loom Weaving," is somewhat misleading. It suggests a broader field than is covered, the book being chiefly an exposition of a particular loom. The first chapters, "The Primitive Loom" and "A Chat on Weaving," contain little information about their respective subjects, but serve principally to introduce the "Todd loom" and to state in general terms the training value of weaving. They do not contain enough general information about their respective subjects to make the descriptions intelligible to those not already familiar with a loom and its use in weaving.

Chapter 3 considers work with felt and paper mats, splints, etc., the former as preparatory to loom-weaving. The next ten chapters contain directions for using the Todd loom, information regarding the selection, preparation, and dyeing of materials (the latter copied from another book), and detailed descriptions for weaving rugs, mats, hammocks, towels, blankets, etc.

The working directions lack clearness and force, due in part to the fact that the matter is neither well organized nor logically arranged. The processes necessary for making any given article are distributed through the book in such a way as to make it difficult for practical use. This difficulty is increased by the fact that the chapter

titles are not always significant of their contents. The one on "Raffia Mats" devotes two pages to this subject and nine to others.

The last chapters suggest songs, games, and stories to be used in connection with the work, and give a bibliography.

The book on the whole contains little information, and, unless the Todd loom is accepted, has little of interest and value.

It is well published, attractively bound, and the illustrations are good.—Lucy Hess Weiser.

Handbook on Liner Perspective Shadows and Reflections. By Otto Fuchs. Ginn & Co., Boston, 1902. 8×10¼ in.; pp. 34+13 double-page plates; price, $1.25.—Seldom does the author of a book on drawing succeed more fully in accomplishing his purpose than has Professor Fuchs in this handbook. He aimed to produce a clear and comprehensive, yet concise, treatise on perspective drawing for the use of students of art and architecture, and he has done it. It is not overloaded with intricate problems, neither is it lacking in problems involving vital principles. Those given are well selected for the purpose of illustrating principles and lead directly to practical results. The plates are well made and clear; they are printed on sheets of thin paper and conveniently held in a portfolio in the back of the book.—C. A. B.

Training in Woodwork. By James M. Tate, Instructor at the University of Minnesota. Published by School Education Co., Minneapolis, 1902. 5½ × 7¾ in.; pp. 120; price, $0.85.—The needed book on woodworking has not yet been written. Up to the present time every writer of a book on woodworking for use in manual-training schools has failed because he has made the book fully as much an exposition of his own particular course of instruction as he has a description of tools and processes. No book that is based upon a course of study suited to some peculiar set of conditions will ever be generally adopted by manual-training teachers, and especially is this true if these conditions are those of the college of engineering. Not that the college of engineering is unable to offer suggestions to teachers of manual training, but that the course suited to the college is not the course suited to the elementary school nor even the high school. This means that neither the models nor the order of exercises in the college course are of much value to the teacher of manual training in the lower schools. If the college instructor wishes to produce a book of value to the manual-training teacher, let him make a clear and scholarly description of tools and the best methods of using them, without special reference to his own particular course of study (which is pretty sure not to be acceptable to other instructors in his own grade of work, not to mention those in lower grades). To this he may add an explanation of methods of construction, especially in cabinet-making and pattern-making, valuable information concerning the materials used in woodworking and the best methods of finishing wood.

From the manual-training standpoint Mr. Tate's book is no worse and no better than several others that have appeared. It has some good points; so have others. Although it is "designed for use in manual-training and technical schools," it will never receive the desired attention from the former, however valuable it may prove to be for use in Mr. Tate's classes at the University of Minnesota. It consists of three parts: (*a*) carpentry (better termed "joinery," considering its character); (*b*) wood-turning; (*c*) pattern-making. The course explained is intended to cover a period of about 160 hours. The book contains about two hundred illustrations, mostly from line drawings.—C. A. B.

PAMPHLETS AND PRINTS.

Ipswich Prints. Second set, 1902. By Arthur W. Dow, 244 Vanderbilt avenue, Brooklyn, N. Y. The set contains six prints, each 7 × 8 in., and a sheet of explanations; price, $1.50.—These prints are intended as examples of composition and color for the use of students and teachers. They are made by hand on a small press in Mr. Dow's summer studio at Ipswich, Mass. Teachers who have seen the first set published a year ago, will be glad to welcome the present one. A third is announced consisting of six Japanese ink sketches.—C. A. B.

Pleasant Work for Boys and Girls. "For winter evenings, for Christmas time and for vacation days." By W. H. Wheeler, 40 King street, Worcester, Mass. Published in the interests of industrial orphan homes in India and Turkey. 4½ × 7 in.; pp. 24; price, $0.05.—To the manual-training teacher this seems to be merely an alphabetical list of about 280 different things to make without telling how to make them. Some suggestions concerning processes are given, but they are not of the sort that a wise teacher of manual-training usually gives. Its only value to the manual-training teacher lies in the fact that it contains an extensive and more or less suggestive list of things that can be made by boys and girls. For the use of the boys and girls themselves the book is entirely inadequate.—C. A. B.

The following have been received:

Linear Drawing and Lettering for Beginners. By J. C. L. Fish. Published by the author, Palo Alto, Calif. 7 × 11½ in.; pp. v + 65; 46 figures; price, limp cloth, $1.

Blank-Book for Lettering. With plate of alphabets, to be used with "Linear Drawing and Lettering." By J. C. L. Fish. Published by the author, Palo Alto, Calif. 7 × 10½ in.; 30 sheets ruled on one side; price, $0.25.

Practical Cooking and Serving. By Janet McKenzie Hill. Published by Doubleday, Page & Co., New York. 5¼ × 8 in.; pp. 731; 200 illustrations; price, $2 net.

Basket Making. Being the first book of the "How To Do It" series. By T. Vernette Morse. Published by the Art Craft Institute, Chicago, 1902. Sold by Thomas Charles Co., Chicago. 5 × 6¾ in.; pp. 32; illustrated with line drawings and half-tones; price, paper cover, $0.25.

How to Make Rugs. By Candence Wheeler. Published by Doubleday, Page & Co., New York, 1902. 5 × 7½ in.; pp. 130; illustrated; price, $1 net.

Year Book of the Council of Supervisors of the Manual Arts, 1902. Dr. James P. Haney, secretary, Park Avenue and Fifty-ninth street, New York city. 6¾ × 9¾ in.; pp. 165 + 12 for notes, illustrated; price, $3.

Addresses and Proceedings of the Minneapolis Meeting of the National Educational Association. Irwin Shepard, secretary, Winona, Minn. 6 × 9 in.; pp. 1021; price, $2.

What Can Our Schools Do for Foundry Apprentices? By P. Kreuzpointner, Altoona, Pa. Reprint of a paper read before the American Foundrymen's Association.

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IS HIGH-SCHOOL PHYSICS TOO MATHEMATICAL AND MANUAL TRAINING TOO MECHANICAL?

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IN the July number of the MANUAL TRAINING MAGAZINE there appeared an address by G. Stanley Hall delivered before the New England Association of Physics Teachers at Boston, May 24, 1902. This address deserves a careful reading, and an answer. It deserves a reading because it comes from a man of high standing in educational matters and contains valuable suggestions on the spirit which should animate the teaching of physics and the mechanic arts. It calls for an answer because it emphasizes an already too prevalent tendency toward dissipation in the teaching of these subjects.

Dr. Hall attacks the subject "as a student of education," disclaiming special knowledge as a teacher of physics or experience in the mechanic arts as now taught in our manual-training high schools. To this I would raise no objection, for the theoretical man sometimes grasps principles and truths which are far in advance of actual practice, and often points out methods which prove to be useful, and which would have been delayed if left to the surer, but slower, steps of induction. But theories have to be verified by experience before they can stand as truths. In this reply I shall speak only from experience.

First of all, I certainly share the regret which Dr. Hall feels that the number of pupils taking physics in our secondary schools is on the decline; and I am inclined to agree with him that the fault is in the prevalent methods of presentation. Nothing is truer than that teachers lose a fine opportunity when they fail to utilize that eagerness in the mind of the youth to learn of the many historical incidents which have accompanied the discovery and development of every physical law.

Teachers are often short on the side of psychology, failing to realize that teaching involves a knowledge of the child-mind as accurate as the knowledge of the law to be taught. I do not mean that a teacher of physics, or indeed of any other branch, should know all the abstract theories of the mind, or that he is called upon to accept the ancient dogmas and technique of the so-called "mental faculties," or the doctrine of duality of brain function and mind. But I do mean that before a subject is presented to a pupil, the teacher must know what will arouse the necessary interest in the pupil's mind and secure the motive which is requisite for self-activity. He must know what experience the pupil has already had along the line of the subject-matter to be taught. He must ascertain whether this experience is adequate—whether the necessary apperceptive centers have been installed. The experience of the average student will generally contain ample material on which to build, and this experience must be found by the teacher. When it is wanting it must be supplied by experiment. I have often noticed that boys from the farm grasp the subject much more readily than do those brought up in the city, although the latter may be far in advance of the former in the conventional studies of the curriculum. This is because the country boys' perception is enriched by a stock of practical experience. This experience, when amplified by experiment, furnishes the data for the laws of physics.

The mistake made in teaching physics lies in presenting formulas for verification instead of constructing formulas from experience. A formula should be nothing more than a statement in mathematical form of something which the student knows from experience seen in his experiments—nothing but a writing down in simple symbolic language the generalized results of his work, simply stating what he already knows. The formula is of use to him because it may serve a purpose in other and transposed forms in the solution of problems involving calculations which transcend experimentation. But the general formula is not only easy of comprehension, but it is already known as soon as the student has really grasped anything of the real content of the principle sought. The trouble is not, as Dr. Hall claims, that too much and too early mathematics is insisted on, but that the mathematics is presented at the wrong end of the process.

I shall agree that high-school text-books are not only faulty in method of presentation, but that they are growing worse. They begin by a mathematical statement "to be proved," instead of ending with a mathematical statement of facts actually seen; and I am at a loss to

understand how men competent to grasp the subject of physics and to write books on it can so completely ignore the first principles of mental acquisition, and leave entirely out of consideration the mind of the pupil beginner.

Take for illustration an example from one of the too numerous popular text-books: Under the topic "acceleration," the author first gives a formal definition of acceleration in the following words: "Acceleration is the time rate of change of velocity." This must be a precious morsel to a young beginner who has never in his life had any conscious experience in observing either "time rate" or "acceleration." This is followed by "formulas for uniformly accelerated motion," as follows: "Let a be the acceleration, or the gain in velocity per second acquired in a second of time. (Unless otherwise stated, the unit of time used will be the second common or mean solar time, of which there are 86,400 in a mean solar day.) Then in t seconds the velocity acquired will be $v = at$. Since the gain in velocity is uniform, if the body starts from rest, the average for t seconds is $\frac{1}{2}(0 + at)$, or $\frac{1}{2}at$. The distance passed over in t seconds is then $\frac{1}{2}at \times t$, or $\frac{1}{2}at^2$. Hence $s = at^2$."

I, of course, do not complain of the accuracy of these statements. I quote them simply to show how ridiculous is such an introduction to this subject to an inexperienced beginner. Following this formula is given a list of problems to be solved by it. The student having no actual conception of the true relations of the facts which these symbols represent hunts through his problem for what he thinks corresponds to the symbol for "distance," for "acceleration," and for "time," and substitutes these in his "formula." This involves no more thought than would be required in hunting among a lot of assorted corks for the right ones to fit bottles of various sizes.

Atwood's machine, an apparatus for showing accelerated motion, is given in the book just quoted several pages in advance of these problems as "an experimental proof" of the law of accelerated motion.

Now, if the beginner start with this, or better with a simple ball and inclined plane, he could see the acceleration, and time it in a very simple and natural way, and a record of his observations would constitute his formula—nothing more than an abbreviated generalized statement of what he had seen. When a problem is then stated, he thinks in *form* instead of in *symbol*. In other words, he really *thinks*, instead of groping after the intangible. He is not discouraged, because he knows what he is doing. He likes physics because he understands it.

The "mathematics" as such disappears, and he rapidly acquires a grasp and an easy comprehension of the whole subject. Accuracy in experimentation becomes a pleasure because a necessity. The student's pleasure grows with his own conscious power, which, as we all know, is the keenest of all human pleasures.

Every teacher seems ready to accept as sound pedagogics that in teaching we should proceed from the concrete to the abstract; but in most of our modern text-books the reverse is actually practiced.

It would be more in accordance with sound teaching to open the subject of accelerated motion with a picture of a boy sliding down hill than with a meaningless formula. In looking at the picture the student immediately associates the lesson with pleasurable experience, the philosophy of which he is eager to comprehend. This comprehension comes to his mind in all its fulness in the formula which results from the experience of this observation, but never from the formula before the terms of which have become symbolic of his actual perceptions. There is a place for the picture, and a place for the formula; the one gives a natural and pleasurable introduction, the other gives a satisfying sense of power possessed by every conclusion reached by normal processes.

It is here that I must differ from Dr. Hall in the teaching of physics. Instead of deferring mathematics to the latter part of the student's course, *I would defer it to the latter part of each lesson.* It may be true that "this exactness, which involved applying mathematics, came very late in the history of physics;" and it may also be true, as is often asserted, that the development of the individual typifies the development of the race; but, admitting all this, it should not be forgotten that it is *process*, and not *time*, which constitutes the kernel of this analogy. The cycle of historical development, so far as process and method are concerned, should be completed in the presentation of every principle. By this I, of course, do not mean that elementary students are brought at once to expressions involving mathematics which they have not mastered, or that the elementary lesson should be final; far from it. I simply mean that mathematics, as an important and necessary tool of physics study, should be employed by the student from the first to the last day of his course.

The "fascination" of the lecture which Dr. Hall says was the delight of his school days has its dangers. Important as it is that the interest of the student be secured, it should not be done at the expense of the working power of his mind. It must be confessed that the

"fascinating" lecture too often obstructs the progress of the student. He comes to regard the subject as a sort of vaudeville show, or an exhibition of sleight-of-hand which begins and ends in mere entertainment. It is not uncommon to see an audience held in almost breathless attention by some scientific spellbinder while he "demonstrates" the wondrous laws of the known, and the unknown, by skilfully manipulated apparatus, and it is notable how little the audience really knows of the principles treated after the lecture is over and the "fascination" wears off. This kind of treatment may make pupils "walking interrogation points about ether, atoms, X-rays, nature of electricity, etc.," but it does little toward giving them the power of intelligently answering these interrogations. The lecture may have its uses, but it becomes dangerous as a teaching agency when followed as a business.

The problem of teaching physics properly is not specially one of the high school or of the college; it is one including as a necessary part of the process a proper study of the mind of the student. Lack of interest and comprehension of physics is quite as common among college "men" as among high-school boys, and proper methods of presentation in college classes are no less necessary, although much less common, than they are in the high school.

It will be seen that what I have here said, when compared with Dr. Hall's paper, contains some important agreements and some important differences of opinion. I agree with him that the human interests which naturally inhere in the subject of physics through discovery — that the actual handling of the things that have "go in them" should all occupy an important place in the student's work, and that they are too often neglected; but I must differ from his opinion as to the time and method of introducing physical measurements, and the application of mathematical methods, as well as to the relative importance of the lecture.

Although not formally stated, Dr. Hall's paper embodies four distinct considerations, viz.: (1) methods of teaching physics; (2) the making of physical apparatus by the student; (3) methods of teaching the mechanic arts; and (4) the correlation of physics with manual training. Having considered the first, the method of teaching physics, I now pass to the second, the making of apparatus by the students.

The old lecture-demonstration method, in vogue years ago when the "professor" made all the experiments with expensive apparatus set

up and manipulated by himself, has to a considerable extent passed by. It is now quite generally recognized that the ends, both of economy and of pedagogics, are best served by encouraging the student to manipulate his apparatus; that the apparatus should be simple; and that, as far as practicable, he should construct it himself. The primary object which teachers had in view in this construction was that of a clearer understanding of the principles involved in the experiments. A simple apparatus in which every part is constructed to subserve a conscious purpose is better understood than an apparatus of finer and more complicated construction. In his own construction he learns to distinguish the essential from the non-essential elements, and to isolate the principle involved by freeing it from unrelated mechanical details. The co-ordination of head and hand in the adaptation of means to ends involved in the process of making simple apparatus is of great value. The student acquires a certain crude skill in the use of his hands in thus serving the purposes of his head. His inventive powers are stimulated and quickened, and his interest and comprehension are strengthened and promoted.

This important agency in the study of physics has been brought to the student in our best high schools by the addition of a laboratory workshop, where, during outside hours, willing students may be found preparing the apparatus for the experiments of the following day. This work possesses several features which are sought by manual-training schools proper, and many of our modern manual-training high schools had their beginning in the interest created in the physics-laboratory workshop. The Kansas City Manual Training High School, which (if I may be allowed this personal reference) it has been my privilege to organize and direct, had its origin in the physics laboratory of the Central High School, where I was a teacher of physics for fifteen years prior to the building of the Manual Training High School six years ago.

The function of the physical-laboratory workshop is the construction of illustrative apparatus. It makes very little of the processes of construction. Skill in workmanship is not insisted upon. Parts are put together without special reference to the best practice in construction. The object here is the thorough comprehension of the principles of physics. Incidentally the use of the hand in aiding the mind in its researches strengthens both and produces a most wholesome reaction; and this, let me note right here, is the correlation between physics and manual training for which Dr. Hall pleads, and it may freely be

admitted that the value of this kind of exercise has not been overestimated by him. But it cannot be too strongly insisted upon that this is *not* the chief function of the mechanic-arts high school; and there is no place where this fact is better illustrated than in the physical-laboratory workshop itself. It is here that the necessity of mechanical processes becomes evident to the teacher of physics who has not the time, if he has the skill, to teach them. The making of apparatus in the crude way which may serve the end of physics has an important function, but it may be almost wholly wanting in that training which proper construction subserves. The trouble with the psychologists who write learnedly on this question seems to be in their failure to recognize the educational value in doing something with the hands correctly and well. They seem to see nothing in manual training beyond furnishing amusement, entertainment, recreation, relaxation, or correlation. They stubbornly refuse to recognize the process of acquiring mechanical skill as a proper or a possible motive. They cannot see how it is possible for a boy to enjoy himself while acquiring power to contribute to the world's work, and when they are forced to admit that he does enjoy his work they are sorry for it, and deplore it as something abnormal and illegitimate. It does not prove their theory of the making of tops and whistles as necessary motives.

Now, manual training as taught in our best mechanic-arts high schools does, as rightfully it should, contribute to the requirements of relaxation, physical exercise, and correlation; but I must insist that it has an educational value peculiarly its own which is second in importance to no other. This leads me to the third consideration: *the method of teaching manual training.*

The method of doing a thing should be determined by the objects to be attained by the doing. I shall assume, then, that the object of manual training is the development of the brain, so as to give it a mastery over the hand to the end both of a fuller comprehension of social and industrial problems, and of the acquirement of the necessary skill in doing the world's work. Dr. Hall freely admits, and even insists, that "no kind of education so demonstrably develops brain as hand-training," and that "doing is an organ of knowing, and the education of the booklings who neglect it is unreal, formal, and superficial." He goes on to say further: "Motor education has not only come to stay with the world, but every sign indicates that it commands the future, and has before it a surer and greater growth than any other field of education."

Now, whether manual training will hold an important place in the future will depend largely on how it is taught. I have a fear that if the current of recent pedagogical philosophy is not checked, the present impulse toward hand-training will soon lapse, either into a species of vague tinkering, which is meaningless to the practical world, or into a formal didactic classroom farce where the work (?) is in the hands of teachers who learned it from books. Our philosophers seem to entertain the fear that our boys will actually do something practical —will acquire an ability to do something well; that they are in danger of turning out pieces of work that a carpenter, cabinet-maker, or machinist might respect. By implication they assume that mechanics are necessarily uneducated people, and that to do anything that would meet with their approval would be unphilosophical and "illiberal." Dr. Hall says that, "to be really liberal, the hand must simply be used as an instrument for opening the intellect, and even the imagination, and therefore be predominantly humanistic." Now, if this statement contains any truth, it is probably to be found in the meaning this writer attaches to the word "liberal." The exact converse, it seems to me, would come nearer the mark, viz., that if manual training is to be really educative in its broadest and best sense, the *intellect* must be used as an instrument in directing the will in gaining control of the hand, bringing it into co-ordination with the brain. This co-ordination is conditioned on motive, and on the constant and intelligent exercise of the will in skilfully adapting means to ends. The *motive* must be natural and adequate, and the exercise of the *will* in gaining a masterly direction over the hand must be sufficiently strenuous to realize results.

Dr. Hall thinks the motive should be looked for in play, in entertainment, or in illustrating a natural law (as in physics) previously conceived. While all these have their place in education and enter in a slight degree into the work of high-school manual training, they are incidental and wholly inadequate as motives. To assume that a student does not enjoy the possession of skill, as well as the conscious acquirement of it, is grossly to underestimate the average boy. It is a matter of daily occurrence to see boys show the keenest pleasure as well as pride in the successful completion of their exercises—these same exercises which Dr. Hall despises so much.

A few weeks ago I stood watching a boy as he was putting the finishing touches on his first shop exercise, which consisted in "squaring up" a block. He took great pride in showing me that no light

would show under his try-square as he moved it along the block. He had succeeded after several attempts in making his block exactly square. With beads of perspiration standing on his forehead, he further showed me that the try-square would fit equally well if placed across the end. He had succeeded in sawing it off square. All angles were exactly right angles. He had made a true parallelopiped. I then asked him if he would not rather be making a kite—something he could use in his play. "Oh," said he, "anybody can make a kite. You don't need a plane, and square, and saw to do that. I used to make kites when I was a little kid." "How did you do it?" "Oh, just fasten some sticks together, paste some paper over them with flour paste, get some carpet rags for a tail, and a ball of string to hitch her to, and she's done." "What are you going to do with your block?" "Take it home and let my father see it. He said he didn't believe I could saw off a board straight, and now I'm going to show him." "What is your block good for? Can you use it for anything?" "No, sir, but I know how to square a piece of stock, and to saw to a line, and you have to do that in pretty near everything you make." The teacher had pointed out the all-pervading occurrence of the ninety-degree angle in wood construction, at the beginning of the exercise. Before leaving the boy I suggested a slight amendment in the use of his English, and complimented him on his accomplishment in making such an excellent start in the use of his tools. Most of all I admired his philosophy, which seemed to me sounder than that which is often evolved from the inner consciousness of some older persons who know so much and who can do so little.

This concrete illustration seems to me quite enough to reveal the motive in making the exercise. In the first place the boy feels that he is doing something worth doing. Secondly, he is acquiring skill, and feels a pride in his new power. And here let me insist again that this consciousness of growing power to do something that the world wants done is the most prominent of all human motives, regardless of the age of the individual. He who has not noticed this trait, even in very young children, has certainly not studied them very closely. Thirdly, the boy feels a pride that he has done something that his skilled elders will respect. He has to that extent raised himself to the level of his superiors. He feels a touch of the dignity and exaltation of manhood. He feels a new possession—he has found a key to purposeful practice in constructive work. He has gained intelligence in this acquisition of so important a means to such a diversity of ends.

He is satisfied. The motive is inherent, persistent, and adequate; and all this without a *product* which is immediately "*usable*."

Let us now briefly consider some of the motives which Dr. Hall would place before a boy in a manual-training school. "Tools and machines," he says, "are not educative unless they open the world of thought that these have made. The jack-knife and whittling school, the simplest chip-carving and repoussé work, are better teachers than all the formal and methodic products of manual schools stimulated by prizes and competitive exhibitions."

I was not aware that the giving of prizes is one of the practices in manual-training high schools. Wherever the practice may be in vogue, however, whether in manual-training or other kind of school, I would join with Dr. Hall in condemning it; but as to exhibitions, I can see no harm in showing pupils' work, if they make anything worth exhibiting. I have never known a manual school to have the students make things just for the purpose of displaying them. Exhibits are usually made up of exercises representative of the regular daily work of the students. It is implied in the above quotation that tools and machines are most educative when least used; that in order that they may be instrumental in opening the "world of thought" they must not be handled; that the boy, in order to appreciate a turning lathe as a thought-opener, must use his jack-knife! This logic seems to bear a striking resemblance to the ancient doctrine that the best way to learn a subject was to study something else. I am wholly at a loss to understand how anybody who makes the study of the mind and body of youth a serious occupation can conceive the notion that a boy will be better pleased in being limited to the use of a jack-knife than in using other and better tools, when he is strong enough to use them in the proper manner. Boys of high-school age might be cajoled and petted for a short time by the immunity from their lessons which whittling would give them, but they would have no abiding respect for the school or the teacher who would fool away time in this manner. Manual-training high schools of today wherein are taught, under skilled and educated men, the mechanic arts in strict accordance with the best current practice command the respect of the mechanical and business world. The intelligent taxpayer who sees this work feels that he is getting the worth of his money, that the boys are really doing something. But what would he say if a school were managed by Dr. Hall's plan — that of making something that the boy could play with, something in which the product and not the excellence of its construction

was the sole consideration? Luckily for the public schools, the average man with horse sense — the average taxpayer — will save them from the many time-killing inanities which infest them. So much for the motives, proper and improper, from the view-point of opposite ideals.

Having found a natural and adequate motive in the working out of systematically planned exercises, I now turn to that part of the process which involves the exercise of the will in bringing mind and hand into co-ordination; that part which concerns the *process* to which Dr. Hall seems to attach so little importance. It seems to me as fundamental that the "utility" of a piece of work, in this age of skilled labor, is absolutely conditioned on its being well made. An article put together in an unworkmanlike manner is neither a desirable nor a salable product. Usefulness presupposes skill in construction. It should be self-evident that any immediate interest in the product which rushes to final results is so much the worse for the product. Dr. Hall points to the exercise as an example of form without content, but what about the product which exhibits content without form? What is it that the boy needs most — a *trinket* which has required no skill in making, or *power* to make something well?

Let us look a little farther into the "wooden intelligence" of the graded model. What is the boy putting into his work when he saws to a line and accurately executes the requirements of his shop drawing? He is strenuously exercising his will in gaining a mastery over his movements. He bends to the task with that exclusiveness and singleness of purpose which the effort requires. His hands are erratic and wayward; he brings them into subjection. He is awkward and clumsy; by a constant effort he controls his movements. He finds that before he can use his tools he must understand what is to be done. He bends his perceptive faculties to the drawing till he sees what is required. Before he can make a single move with his hands he must clearly discern relations and dimensions. He knows that these relations must be correctly conceived, or his work will come to nothing. He feels the responsibility of using his head rightly. The process is all-absorbing; he can be thinking of nothing else; it requires his whole attention; he is not concerning himself with the "larger aspects of manual training as a social factor." He is not thinking about tops, whistles, electricity, conductivity, or calorimetry. He is making up his mind what to do with his hands and with his tools; and when he begins to use them, he is strenuously trying to harness his untamed motor activities. The complete occupation of his intellectual and

volitional powers involved in the process is all-absorbing. His attention must be exclusive, keen, and persistent; his patience unflinching. He must gain mental and bodily equipoise, that his muscular energy may not break loose and spoil his work. He will be successful to the extent that the *process* is the all-absorbing consideration. The "content" is intellectual and volitional. He is becoming competent; he is gaining a command of his tools, and of himself; he is acquiring skill; he is being educated. He is gaining something which he can use, in the sense that any acquired power is usable. If it is his lot to be a mechanic, he will, if thus trained, become a good one; if he is to be a director of large industrial interests, his directorship will be intelligent and practical; if he is to be a professional man, he will still find daily demands for an exercise of mechanical judgment; if he becomes a psychologist, his experience in the workshop will save him from some of the mistakes made by those who would leave out of an education one of its most vital and fundamental elements — that of the co-ordinating power of *process per se.* And above all, in this systematic attention to process the boy is learning the power and necessity of careful, painstaking industry. As I have elsewhere stated, it is important that boys and girls should learn to *think*, but it is even more important that they learn to *work.* One of the greatest lessons of life is to make work pleasurable. Work becomes pleasurable when it becomes easy; it becomes easy only on the acquisition of skill; and skill comes only by patient, persistent, painstaking effort to be found in *processes.*

The trouble with educators who deal exclusively in the abstract is that they have never yet been able to treat manual training as an educational agency on equal terms with other agencies. This is shown by their willingness to employ processes in the pursuit of all other branches of learning, while in manual training they will have nothing but "immediate results." What is the important thing in the study of mathematics? Is it usable results, or is it the facility of process? Must a boy build a bridge or measure land before he can study geometry? Must he give or take a note in actual life before he can solve problems in interest? Are all mathematical processes which are daily being systematically worked out on thousands of slates and blackboards in the thousands of schoolhouses, all relating to imaginary values, of no importance? Is the all-absorbing, intense, laborious practice in the running of scales involved in the process of learning to play the piano of no value educationally? Are these exercises steel

"in their inflexibility" and ivory "in their intelligence"? Such, indeed, would be the logic of the critics of the manual-training exercises if carried to other educational agencies.

The truth is, the educator whose knowledge is of books has never grasped the meaning of the true educational value of manual training. He resisted it as long as he could; and when he finds it as an existing part of the curriculum, as he finds other things which are brought about by the evolution of events, he accepts it, perforce, without understanding it; he regards it as factitious, and casts about for a solution of it. Not knowing what to do with it, he plays with it; he writes about it; he tells the boys to do what they like with it; he does everything with it except to recognize it as an educational agency *per se*.

We are harvesting, just at the present time, a large crop of manual-training literature. But it seems to be of the florescent sort. Public-school examiners require that applicants for certificates shall pass in "manual training." Teachers by the hundreds are writing to well-known manual-training men, inquiring where they can get "a book" which will enable them to qualify for these examinations! They see hope in the magazine articles which convey the information that it is not skill — the knowledge of process — which is needed, but only a "larger view," only a propensity. Even some of our normal schools, finding the shops on their hands, and without skilled teachers, are turning the boys loose among the tools and the lumber, with the expert injunction to "make what you please, and make it in your own sweet way." Some schools are even making the noon hour an option between the shop and the playground! Everybody advocates manual training. Some would have it because it keeps the boys out of mischief; some would limit its use to the "bad" boys; others want to use it to make physics apparatus; others to give the boys a trade; and still others to imbue the boy with those "larger" and "wider" sociological views of life which they assume that it is characteristic of a boy to possess! But few there are, outside of the ranks of those who are actively engaged in teaching the mechanic arts according to well-matured methods, who are not either unable or unwilling to justify manual training as they justify other branches. Surely manual training has become a white elephant of mammoth proportions!

This condition I am inclined to attribute to two causes: (1) an excessive conservatism on the part of our older and more influential educators, whose recognition of manual training has been forced, and not spontaneous, and whose conception of its true meaning is still

unformed; and (2) a great disparity between the demand for, and the supply of, skilled teachers of manual training. Superintendents and teachers, feeling the demand for manual training which is in the air, and from which they cannot escape, seek to supply this demand by advocating some use of it which will not require skill to supply. In their helplessness to employ the new educational agency in a legitimate way they try to cope with the problem in terms of their own knowledge and former training, and then to justify their method of treating it in well-worded essay-writing. And now comes Dr. Hall, bolder than the rest, who not only finds justification for manual training in the making of tops and whistles, confining it to articles which are immediately "usable," but who attacks the work of the only class of men — that of skilled teachers — who alone are justifying the employment of this agency at all — work which is commanding the respect of the business, commercial, and mechanical world, and which is actually saving our public schools from a destroying popular criticism. But this attack is unpedagogical, unphilosophical, unscientific, and has been made without a knowledge of the real facts in the case.

The correct method of teaching manual training produces a many-sided result — a result which includes all the sociological relations for which educational writers contend; but its special contribution to education is being neglected by the critics. This contribution, let me again insist, consists in bringing the hand under the vigorous dominion of the will, in placing the student into true relations with the world of constructive industry; in making work pleasurable and easy; in dignifying work as well as the worker; in the acquirement of skill which alone can come from that bending of the energies which are required in *processes;* and in the meeting of those economic demands which our time is demanding from our schools.

Let us now pass to the fourth consideration in this discussion: the correlation of physics with manual training.

I wish at once to place myself as strongly in favor of the correlation of manual training, not only with physics, but with all other departments of the school, so far as it is practicable. In the foregoing paragraphs I have tried to show that the correlation which is incident between these subjects as found in the physical laboratory and in the physical-laboratory workshop, while valuable, is not sufficient; that to subordinate the workshops to the requirements of physics is to rob manual training of its specific function — that of a

thorough training in those mechanical processes involved in the best practice. But when this function is once for all recognized, admitted, and carried out, we are left free to consider the question of correlation between the mechanic-arts workshop proper, and the subject of physics. The question at once takes this form: Can the principles of construction as they must be progressively and systematically taught be applied in the construction of physics apparatus at the particular moment when its use is conceived in the study of physics? After carefully thinking over this question, I am free to say that I believe they cannot. It is clear to me that no such direct correlation as this is possible. In the first place, the principles of construction are taught progressively throughout the course of four years, while physics does not come in our high-school courses till the third or fourth year; and secondly, the rigid demands required of the student both in the strenuous processes of construction and in the reasoning processes of his physics are such as necessarily to engage the undivided energy of the faculties while employed at each.

There is, however, in a well-ordered school an incidental correlation of these branches, which is natural and important. The boy in the workshop is learning — unconsciously perhaps — many things which will be of importance to him when he reaches physics. He comes to know many of the properties of matter by actual contact with it. Contact with force and mechanical power supplies him with a rich stock of actual knowledge, which will be of prime value to him in his study of physics. He is learning in an informal way many of the laws of physics. Teachers of manual training should be, and generally are, familiar with the laws of physics in their practical form, and they impart in a hundred ways these laws while assisting the boys in their work, and while adjusting and manipulating machinery. While they usually impart these laws in an empirical form, the boys possess the advantage of getting the facts at first hand. This possession, which comes to them as actual experience, forms the basis for adequate apperception when in their physics they are called upon to symbolize their knowledge.

Another contribution, even more direct and evident, which the boy skilled in the processes of the workshop brings to his physics is, not a piece of apparatus, but the knowledge and ability to make whatever he needs and has the time to make. He now can make immediate and direct use of his mechanical skill as an unstudied and efficient means to the ends of illustration. Having learned the principles of construc-

tion, and having acquired the power of executing them, he can now make his needed apparatus, and make it well. His processes have become a part of himself, and he uses them in working out the directions of his intellect, and this he will continue to do throughout all the endless demands of a lifetime, whether the skilful hand shall be needed to wield the blacksmith's hammer, the carpenter's plane, the surgeon's knife, the dentist's instrument, the scientist's apparatus, the draftsman's instruments, or the farmer's utensils; and the technical knowledge and brain-power which guide the tool will always be ready for service, whether needed in the preparation of the lawyer's brief, in which a question of mechanics might be involved; in the writing of the sermon, which should reach the life, the experience, and the sympathies of the laboring millions; or in the teaching of classes, which have hourly need of the many illustrative devices which mechanical knowledge alone can bring. Thus can the mechanic arts be correlated with physics, and with almost everything else. But it can never occupy a place in education if robbed of its true function by taking it out of its legitimate sphere before it has scarcely been born, and making it perform vaudeville stunts, scientific demonstrations, and entertainment functions; or in making it masquerade in a valueless and premature rush for "usable" monstrosities, bloated in "content," but caricatures in "form."

Of course I admit, and even emphasize, the thought that manual training should contribute to the "wider view," to the "larger life." It will naturally do this, as do all other educational agencies, by giving it its proper place and its proper sphere; but it is a grave error to suppose that a thing can be known in its true relations with the rest of the world before it is known in itself.

Is, then, manual training "too mechanical"? The answer must be, No. It must stand its tests and submit to the same conditions as do other educational agencies: literature is not too literary; science is not too scientific; mathematics is not too mathematical; history is not too historical; language is not too linguistic; music is not too musical. *Now, in reason, how can we claim that mechanics is too mechanical?*

In conclusion, let me say that in this defense of the shop exercise I am not claiming that it is perfect. On the contrary, improvements are constantly being made from year to year in the light of fuller experience; but let it be fully understood that these improvements are not in the direction of abandonment. They are made toward a more

accurate application of the principles of economic construction, a closer conformity to the most approved practice, and toward a more scientific and systematic arrangement in grading the steps to the end of true and natural progression.

Nor am I denying that usable products should ever be realized in the school workshop; quite the reverse is the case in my own school. Boys who complete their exercises, and who have thus learned how to work, are allowed to plan and to make a "project" for themselves. A few boys have gone so far as to construct a steam engine, a dynamo, or a motor before the completion of their senior year. But boys who do this are those, and only those, who apply themselves rigidly and persistently to their exercises during the first part of the term; for it is only by the mastery of *processes* that they can construct such machines at all.

It is pertinent here to inquire what else these boys who have mastered processes and built "projects" have done during their course of four years in the high school. They have completed the full courses in mathematics, English, science, language, and have supplemented these with such electives as bookkeeping, shorthand, history, civics, and music. They have made themselves ready to go to work or to enter college, as they may choose. They pass the entrance examinations to Cornell, Yale, Harvard, and the Massachusetts Institute of Technology. In the experience of the past few years, some observations have been made on boys who want to "make something" ahead of their training—boys who are feverish for "products." Yielding to their plea that they were already "handy with tools" and that they had a special gift for mechanical work, we have indulged a few of these boys in the pursuit of their bent. In every case their product has been a failure, when judged by reputable standards of construction; and their neglect of processes left them without power or skill to improve upon their first attempt. The difference between the boy who follows such a course and the boy who works out his exercises is the difference between the *tinker* and the *mechanic*.

SOME PRACTICAL PROBLEMS IN MANUAL TRAINING.[1]

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I DO not propose to deal with the theoretical aspects of manual training in this paper, but with certain practical considerations and some very practical quantities in regard to this work in the elementary school, which I suspect are of more interest to the Department of Superintendence.

The main elements of weakness in the manual-training situation at the present time — and in this outlook I include work in domestic art and domestic science — it seems to me can very well be summed up under two heads: first, isolation or lack of organic connection with the practice and spirit of the other work in the school; and, second, the factor of expense. The first fact undoubtedly is partly due to the change and readjustment through which all school work is now passing, in which each subject is seeking to find its place and relation to the whole. From this point of view manual training is simply in the same condition as the other subjects of instruction, a condition that cannot be much improved until greater unity has been reached in the entire course of study.

The isolation of handwork, however, is also due in part to the conditions under which this work was introduced into the school system. The fact that manual training in our country began in the high school and next appeared in the upper grades of the grammar school, and always through the medium of the special teacher working in a special laboratory, has in itself contributed much to keep the work apart in spirit and practice from the other school activities. Under such conditions it is little wonder that the special teacher has worked largely by himself and been content to measure results by his own standards.

When to this situation is added the further fact that the conception of manual training held by the special teacher is often that of some cut-and-dried scheme of exercises and models, the tendencies making against real unity are clearly evident. I do not, of course, wish to lose sight of the fact that such work is often the most vital and stim-

[1] A paper read before the Department of Superintendence of the National Educational Association at Cincinnati, February 26, 1903.

ulating influence in a school, but to point out that even when this is true the lack of connection has commonly been no less evident.

The full correction of this evil and the solution of the practical problems presented will not quickly be reached, but the corrective tendencies are already evident; indeed, they are well under way, and their progress can undoubtedly be greatly furthered by the influence and assistance of the school superintendent.

In the first place, greater organic unity will obviously be possible only when the special teachers of handwork have attained a professional outlook beyond that represented by the technique of their subject, when they recognize larger ends than mere skill in manipulation and when they see their subject in broader relations both to industrial life, on the one side, and to child life, on the other. Without such a broad grasp of the problem on the part of the specialist it is idle to expect manual training to enter into thoroughly natural relations with the rest of the school work.

When a superintendent refuses to employ a professionally trained teacher because he can obtain a mechanic for $200 less salary, it is evident that not much headway is liable to be made in this direction. Advance will be made very much in the degree that men and women who have been trained to look at the whole and not at a part, who know something about child-nature and the tendencies and forces of education, are given preference over those whose idea of handwork is confined to some narrow technical formula. With broadly equipped and resourceful teachers it should certainly not take long for handwork to reach its proper place in the scheme of the whole.

Under such direction will come the introduction of richer content and more thought material into the work. With teachers accustomed to consider principles rather than a formula, growth will inevitably be made toward greater scope and suggestiveness in subject-matter. Progress in this direction need not mean work of greater complexity, but, on the contrary, should make toward things of greater simplicity and more familiar use. Less attention will perhaps be given to mere skill and more to breadth of information and insight. Instead of elaborate and erudite systems, built up by the endless drawing out of meager subject-matter, will come the effort to set forth the elements of industrial life in simple everyday terms. We shall be liable to have less of instruction, but much more of construction, in our work. When the problem is approached in this way, relations to locality and the character of the particular pupils in hand will be studied. No one

scheme will be regarded as unduly important, but out of the whole field of art and industry will be selected those types of most significance for each special set of conditions.

Under such an influence we should expect to find a different line of work in the schools of Grand Rapids from that undertaken in the schools of Pittsburg. In a town where three-fourths of the working population are connected with textile mills we should look for the development of weaving and applied design and the study of simple machines. Where clay-working is a prominent industry we might find the making of simple pottery built up by hand and enriched with simple decorations as a central feature in the school handwork. In each case the real life of the community would furnish the key to subject-matter, and the problem of the teacher would become that of reducing its suggestions to methods and projects practicable for the school.

One other tendency that is doing much to overcome the isolation of manual training as a school subject is represented in the steadily increasing introduction of the work into the lower grades under the regular teacher. In this movement lies perhaps the largest hope of bringing handwork into natural and vital relations with the educative process as a whole. When handwork is taught by the regular teacher, it will at least receive the same treatment as the other elements of the course of study and can hardly escape establishing relations with them in the course of time. But, after all, as Dr. Dewey has said in an address before this body: "What gets to the child is dependent upon what is in the mind of the teacher, and upon the way it is in his mind;" and because of this fact handwork will enter into natural and effective relations with the course of study as a whole only to the degree in which the teacher appreciates and feels the need of such relations. Evidently no external prescription from supervisor or superintendent will take the place of this attitude of mind. Nevertheless, as in all school work, much may be effected through administrative influence. If that influence is toward natural and sensible correlations with the other elements in the course of study, such as history, geography, and nature study, with allowance for individual latitude where practicable, rather than toward narrow "courses," it is plain that the progress of handwork toward its proper place in the school cannot fail to be greatly promoted.

In such work no one material or process has any paramount value. Natural relations will be secured only when the teacher feels free to

make use of clay, paper, wood, yarn, thread, cloth, or other available material that will best serve the purpose in hand. Such a proposition undoubtedly raises serious problems in regard to the supply of materials. These problems can be worked out only by experience, but it seems safe to say that under proper administrative direction they will not prove insurmountable.

One of the important correlations that make toward greater vitality and fruitfulness is that between constructive work and art instruction. We have been prone to consider these subjects quite apart as so much construction, on the one hand, and so much art teaching, on the other; and yet it is not only true that the art of a democratic people must express itself largely in the things of common use rather than in painting and sculpture, but it is also true that through these channels of simple use and understanding lies the readiest approach to the æsthetic appreciation of the child. The simple decoration of a box destined for some definite use appeals to him most strongly when the abstract composition with brush and paper leaves him cold. It is, indeed, only through the application of design to definite use that it becomes of meaning, and consequently of educational value. We have generally started with our design, and then looked about for some place to apply it. Work of this kind may develop into some sort of facility and show of results, but it lacks bottom and meaning in the child's mind and is apt to be readily forgotten.

When the start is made from the other end, and the making or beautifying of some actual thing calls for the design, the idea becomes full of meaning and interest. The process becomes alive with real qualities. It is no longer a matter of merely formal relations, but a question of what can be done to improve the form and enrich the surface of this particular construction in wood, or clay, or weaving, or basketry, or needlework. Each material has its own peculiar possibilities and limitations, and the whole process is a constant study in adapting means to ends. Each instance develops some concrete way of realizing beauty in simple things and brings the meaning of art down from an abstraction to a reality.

Working co-operation in this field is by no means impracticable. If the art supervisor and the manual-training teacher can be brought to work upon the same problems, the influence of both will soon be blended in results vastly superior in artistic quality to most of our present work. Much may be done here to vitalize the drawing and color study of our schools, and at the same time to build up a true

appreciation of right principle in design. A practical demonstration of the rich possibilities of such co-operation is afforded in the interesting and artistic handicraft produced at the present time in the public schools of New York city, where both the art and constructive work are in charge of one director.

In this problem of the lower grades one of the practical difficulties most often cited is that of size of classes. It is claimed that fifty or sixty pupils in a class present an insuperable obstacle to the introduction and proper teaching of handwork. It is without question that such classes present serious problems in relation to any work that requires simultaneous activity on the part of each and every pupil, and that under such conditions any work of this kind cannot reach its fullest possibilities. In most school work these problems are largely avoided, inasmuch as real activity is commonly demanded of but one pupil at a time.

It is far from true, however, that effective and valuable instruction in handwork is impracticable with classes of even the size just mentioned. The best and most adequate proof of this proposition is the fact that such work is at the present time being carried forward successfully in a considerable number of cities and towns. In a large primary school not far from New York a varied program of handwork is provided throughout the different grades from the kindergarten upward. In this school the number of pupils in each class ranges from fifty to fifty-seven. Handwork lessons intimately related to the instruction in number, spelling, nature-study, geography, and history, in which a considerable degree of expression is demanded of the pupils, are given each day, and it has not been the fortune of the speaker ever to have visited a school marked by greater order, neatness, and smoothness of routine than is the case in this institution.

The remaining serious problem in the manual-training situation has been stated as that of expense. This element necessarily conditions the rate of progress of all school work. Manual training undoubtedly means expense. There is no escape from that fact, but the amount of this expense is unquestionably often very much greater in practice than there is any need, and because of this the estimates as to the cost of introducing handwork are often much exaggerated.

The factors of expense are twofold in character: first, as to the special teacher; and, second, in the cost of equipment and supplies. The special teacher is a necessity if the work is to be introduced in the

upper grades, and, as has already been pointed out, the character of the results will depend upon the character of the man or woman employed. This is not the place to suggest economizing. Not only will the character and spirit of the work depend upon the training and outlook of the special teacher, but capacity and knowledge at this point are the best assurance of economy in all other directions.

The place of the special teacher, however, as far as class instruction is concerned, may well be limited to the upper two, or at most three, grades of the elementary school, where, by means of laboratory centers of instruction, his time may be distributed among the pupils of several schools. Below this point the regular teacher may be brought gradually, under proper supervision, to handle all the work that is essential. The problem of developing or training the regular teacher to take charge of such work is, under the usual school conditions, not a simple one. Teachers' meetings, prepared suggestions in printed form, personal conferences, and illustrative lessons by the supervisor all represent helpful means of approach, according to the special conditions presented.

The greatest danger in the situation is that of forcing some arbitrary and externally formulated scheme upon the teacher before she understands its significance. Haste should undoubtedly be made slowly at this point. The great end, I take it, is to bring whatever is attempted into natural relations with the teacher's experience and point of view, so that she may come gradually to make use of constructive work in the same spirit that she employs writing and speaking. In order to make a start in this matter it may be necessary to present the plan of work at first in very specific and detailed form, but there seems little danger in saying that, if more effort were then made to consult the individual sympathies and bent of the regular teacher, richer and more natural results would soon be reached.

In the matter of equipment the manual-training situation presents all manner of possibilities. It is the greatest mistake to conceive that valuable results depend upon an elaborate and expensive equipment. Here, as in all other lines, completeness and thoroughness of material conveniences make toward richness of results, and avoidance of waste in time and energy, but the educational result depends upon the brains and spirit in the instruction, and not upon the extent of benches and tools. A teacher of capacity and energy will develop a rich harvest out of the most meager resources, while a weak man remains a slave to his conditions.

This problem is most significant in regard to the laboratory equipments for the upper grades. Given the room, a comprehensive equipment for twenty-five pupils in benchwork on the usual basis may run up to $800 or $1,000, but it is entirely possible to devise a thoroughly practical equipment for such work that can be obtained in the open market for $300 or $400. Further than this, when the problem is reduced to its strictly essential elements and the benches and fixtures built by the pupils, as was done in the case of the Sterling High School, and the De Kalb Normal School, even these figures may be cut squarely in halves.

On the side of materials it must be allowed that manual training is at present suffering in certain directions from the employment of unduly expensive materials. The zest and enthusiasm that have attended the introduction of certain lines of artistic handicraft, such as basketry and weaving, have led to the use of materials in many ways excellent for their purpose, but objectionable both on the score of expense, and from the fact that they represent materials of a foreign and unfamiliar character. The searching out and adaptation of common domestic materials are a crying need in all this kind of work. Much has been done already, particularly in the South, toward developing local resources in this direction. Grasses, rushes and flags, pine needles, yucca, palm leaves, corn husks, and willow twigs, have all been brought into use, but much still remains to be done.

This matter has an educational as well as an economic aspect. Anything that brings manual training into more direct contact with the common facts and activities of everyday life, and requires it to find its resources therein, makes toward a training in economics that is of inestimable value. For this reason, if for no other, the effort should be constantly toward simplicity and cheapness of material.

With a teacher of proper influence and spirit much simple material for handwork may be obtained from the home resources of the pupils. In one southern town that has come to my knowledge sacks in which flour is purchased, and which would otherwise be thrown away, are turned over to the children, washed by them, and brought to school, where they are used as a basis for work in sewing and embroidery. In another place the common burlap bags used for farm products are secured for the same purpose.

Even in the matter of wood a considerable saving of expenditure may often be effected by studying the possibilities of the cheaper woods and conditions of the local supply. Instead of depending

solely upon the fast-disappearing white pine, such woods as cypress, whitewood, and basswood may often be used with just as much appropriateness and at one-third or one-half the cost. When it becomes a question of doing something or nothing, there are still further resources. The material of the grocer's packing-boxes, which may be obtained at very small cost, offer a supply of planed lumber of which a goodly percentage is capable of being immediately utilized in the school shop and transformed into articles of use and beauty.

The limitations of this paper hardly allow of a reference to the problems presented by manual training in the high school, and yet there is one fact evident in the tendencies in this field at the present time that the speaker cannot forbear to mention. Manual-training workers in the past have to a large extent rested their philosophy upon the disciplinary and formative value of handwork, and have given comparatively slight attention to the subject-matter value and opportunities of their work. Practice has for the most part conformed to this attitude, and the result, as has been before suggested, has been systems or schemes of work arranged with great attention to the development of skill in rather narrow lines, but with little concern as to breadth of knowledge or insight into practical conditions.

A change, however, is becoming apparent in the situation. As the insufficiency and incompleteness of the theory of formal training have come to be recognized, and as the sociological reference has been added to the psychological, it is coming to be seen that breadth of experience and widening of outlook must be added to the mere training in manipulation. With this view, a clearer outlook as to the field of manual work is being obtained. It is seen that manual training means not only a method of teaching, but something to be taught, and that something is the study of art and industry.

With the growth of this idea a rich field of subject-matter is at once opened up, and the question of what is to be presented in our instruction assumes a new phase. This change of attitude is resulting in the attempt to get closer to the real facts of industrial practice, and to represent these facts in a more suggestive and practical fashion. This tendency does not represent in the slightest degree any more of a desire to teach a trade than formerly. It is simply the coming of manual training to its proper estate, as the representative in the school curriculum of the great field of modern industry.

It has been said many times recently that the dominant tendencies of the present age are industrial. If that is so, why should we be

afraid to acknowledge the fact in our school practice? The question was asked in this hall yesterday afternoon: "What is the objection to teaching the rudiments of an industry in connection with industrial training?" What, indeed? Manual training itself has been slow to take this point of view. It has been largely content with forms and symbols, but it is putting these by and looking forward into a larger horizon and a work of greater meaning. In this, I take it, it is but following the tendencies of all education, which is more and more finding the materials of culture and discipline in the facts and tendencies of real life.

SIMPLE METALWORKING IN THE PUBLIC SCHOOLS.

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Arts and Crafts Society, Dayton, O.

THERE are various ways in which sheet copper, brass, iron, and lead can be used in the seventh and eighth grades of the public schools. They can be etched by means of acids, hammered into bowls and trays, decorated by sawing out the design or by piercing a background of holes; simple riveted work can be done, also repoussé. An unlimited field is opened by any one of the above methods.

The etching process being, perhaps, the simplest form of metalwork, will be considered first. Suppose we wish to make a picture frame with a design etched upon its surface, and that the frame is square in shape and similar in design to Fig. 1. Take a piece of sheet copper or brass about sixteen gauge and cut it to the required size. Then draw or transfer the design upon its surface. Now, with the ordinary asphaltum, or black varnish obtained at any paint store, cover the design with varnish, using a small brush for the purpose. Two or three coats may be necessary to give a thickness which will withstand the action of the acid. The frame now has the appearance of Fig. 1, the design being black and the background of metal exposed. Now cover the back of the frame entirely with the varnish, as we wish to protect it everywhere except on the front, where we wish the background of our design to be eaten by the acid. When the varnish is dry, place the frame in an acid-bath composed of less than half of nitric acid and more than half of water. In most cases four or five hours will be long enough to etch the design, but no exact time can be given. The metal will have to be watched, and when the background has been eaten to about one thirty-second of an inch or more, according to the thickness of the copper, the frame may be removed and the varnish scraped away with an old knife, after which turpentine can be used to clean it thoroughly. If possible, heat the metal

FIG. 1.

quite hot and then dip it in the acid-bath, as this will clean it and give a fine color. The opening for the picture may now be removed with a metal saw, and some simple device soldered on the back to hold the picture and also to act as a support for the frame.

If desirable, a fine green color can be obtained on the copper or brass by cleaning it well in the acid and applying a light coat of the following mixture: one part ammonia muriate, three parts ammonia carbonate, twenty-four parts of water (cold). When dry, apply another light coat, and so on, until the required shade is obtained; then apply a coat of banana oil or lacquer, which can be obtained at the paint stores. This lacquer will protect the color and keep it from rubbing away.

FIG. 2.

There is another simple method of etching that can be used where the design is more intricate and finer drawing is required. In this method beeswax is used in place of varnish, and this, having been melted in a dish, is applied to the metal with a brush, care being taken to get an even surface. Over the wax spread a sheet of tin-foil as evenly as possible, and cover the object back and front. On this foil transfer the design by going over the outline drawing with a hard pencil.

Next take a metal tracer, Fig. 2, which can be made from a large-sized sewing needle set in a wooden handle, and go over the design as it appears on the tin-foil. The short needle cuts down through the foil and wax to the metal, and in so doing the edges of the foil are pressed down near to the metal also. In those spots where the etching is desired remove the foil, thus leaving the wax exposed wherever the acid is to attack the metal. Now place the object in a gasoline-bath, and the gasoline eats out the wax where it is exposed, but does not disturb it where the foil protects by its presence. After the wax has been thoroughly eaten from the spots to be etched, place the article in the acid-bath as before.

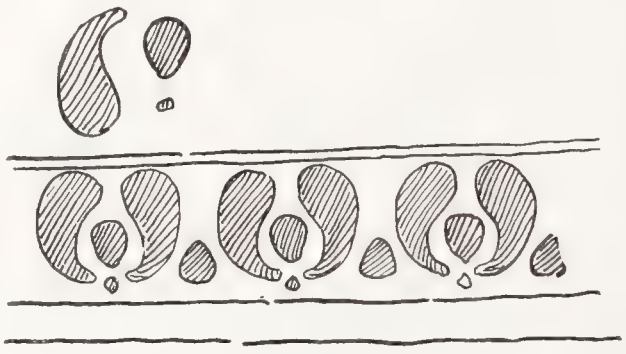

FIG. 3.

In using the asphaltum or wax in the manner described, our design has been obtained in relief, but by painting our background we can get the design incised on the metal. Still another way of using the etching is to allow the acid to eat completely through the

metal, thus obtaining an open effect. In this case a certain width of metal, a full eighth of an inch perhaps, must separate the openings and prevent the metal from becoming weakened by the design. A decoration similar to Fig. 3 could be used in this way, the dark shapes being eaten out.

FIG. 4.

These methods of etching metal can be used in various ways on simple trays, candle-sconces, belt buckles (Fig. 4), and especially they can be combined with woodwork where simple corner-pieces of copper, brass, or lead can be used on picture frames, wooden boxes, and mirror backs, care being taken to harmonize the color of the metal with that of the wood.

Another way of using the metal is the sawing-out process. All that is necessary is the saw-frame, saws for metal, and some small fine files. With a little practice the student can saw out metal decorations such as metal legs, or hinges for boxes, and simple panels or borders for match-boxes, small cabinets, or book-racks. Many interesting problems can be worked out in small articles like belt buckles, candle shades, or simple trays. In Fig. 5 the small shapes of the tray design might be sawed out, while the larger forms of the border could be etched slightly below the surface and colored green with the greening solution, thus combining the two methods. In this way many interesting effects can be obtained.

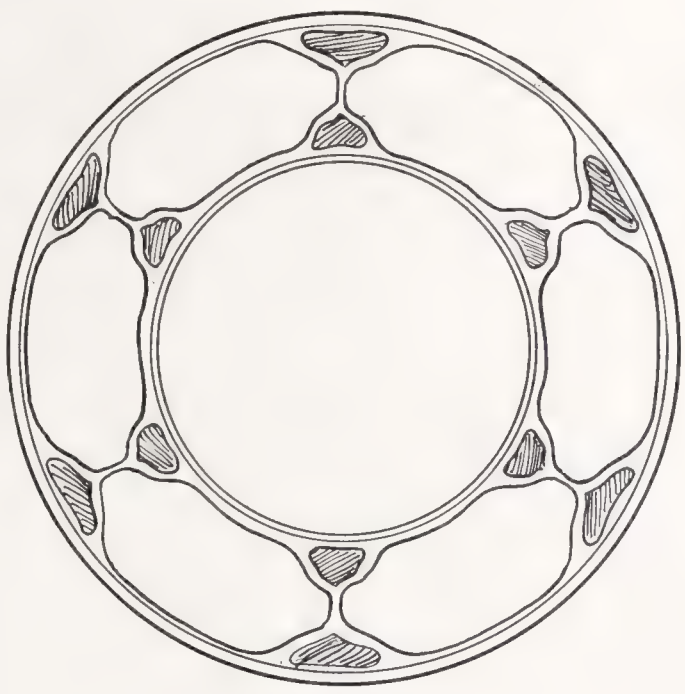

FIG. 5.

The question of appropriate designs for this metalwork is very important, and, in connection with the problem just mentioned, exercises in straight-line panels and borders would suggest ideas, while simple abstract forms can be used satisfactorily. Limit the students to perhaps three forms, as in Fig. 3, and then encourage them to arrange some unit and repeat it as a border. Many natural forms, like maple keys or interesting leaves, supply ample

material when arranged with the idea of obtaining contrast and variety together with carefully arranged background shapes. Too much stress cannot be laid upon the possibilities of pure line arrangement in its relation to applied work; and in presenting lessons in design the pupil's attention should be directed toward a study of Greek architecture. At least have photographs and magazine illustrations in the class, showing good examples of architecture where the line has been used to emphasize the structural element. Then show how this same principle should be applied in making furniture, and even smaller articles like boxes and picture frames. The bent-iron work proves more satisfactory also, if limited, in a measure, to straight-line effects, working with the idea of obtaining pleasing space relations rather than using so much of the scroll movement as a means of filling a given area.

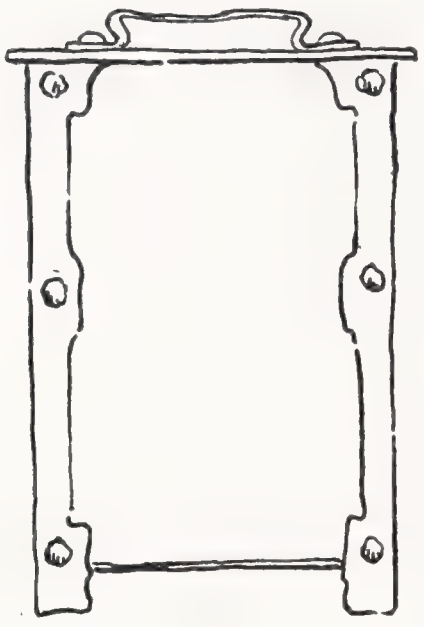

FIG. 6.

Simple riveted work in copper and brass offers certain possibilities to the progressive teacher, who after working out some exercises in this direction, could adopt the work in the seventh and eighth grades. The student designs an article like a jewel casket, candlestick, or ink-well, while the instructor shows him the construction, pointing out the fact that the rivets can be used in a decorative way, thus making more ornament almost unnecessary. The construction is simple, being, in most cases, a corner strip riveted to the sides, as in Fig. 6. This strip may be sawed into a simple contour which, with the rivets, will be all the decoration necessary. Now bend the corner-pieces at right angles, having first punched the holes with a rivet set, or, in the case of heavier metal, a breast drill may be necessary. Copper and iron or brass may be combined and various effects obtained—as copper sides and top, brass corner-pieces, and copper rivets. It is easy to see how etching and sawing may be combined with this work—as in sawing out some *motif* to be used as a center for each side, or etching some decoration on the corner strips.

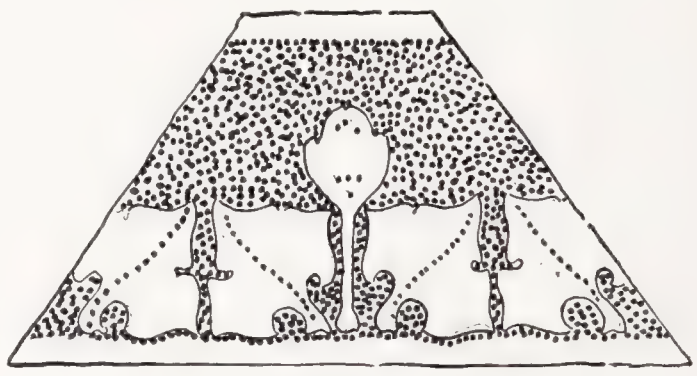

FIG. 7.

Next let us consider what is commonly called the punched brass, although the same method can be adapted to copper. We will suppose the problem to be a candle-shade (Fig. 7) with a perforated background. First work out a pattern for the shade from heavy paper, allowing one-fourth inch for lapping at each end (Fig. 8), and in the design class provide each student with one of these patterns. Have some suitable designs which you have adapted to the problem placed before the class, and then show what the limitations of the material are. Show that a certain dark-and-light effect is necessary, the light being obtained by the punched holes, while the dark is the unpunched brass showing dark against light. Explain that a certain distance must be allowed between the shapes in the decoration, as the width of the punched holes must be taken into consideration if they are to separate the various parts of the design. This would make simple forms more desirable than small, complicated shapes. Now, it is also possible to reverse the plan just mentioned, making the background plain and punching out the design. Having shown the possibilities of the material, together with the problem which you have worked out on the same line, allow the pupils to fit a design to their pattern. This may be adapted from a flower motive, provided by the teacher. Abstract forms, as in Fig. 3, work well in this sort of design.

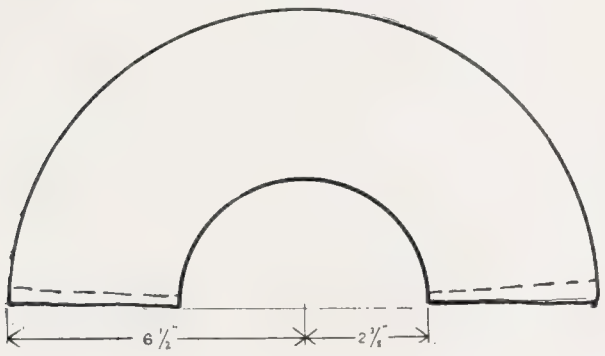

FIG. 8.

The punching is done in this way: Obtain some sheet brass, about twenty-six to twenty-eight gauge. Tack this to a piece of hard-wood plank. Now place the pattern on the brass and outline the shape with a steel point. The design may then be transferred by means of carbon paper to the brass, and the holes punched closely with an ordinary round awl and small wooden mallet. In finishing the shade, the rough side having the bur is usually put on the outside. The two edges of the metal may be overlapped and riveted, or held together with binders, as in Fig. 9. Lamp and candle-shades, lanterns, and gas-screens, are readily adapted to this method of metalwork.

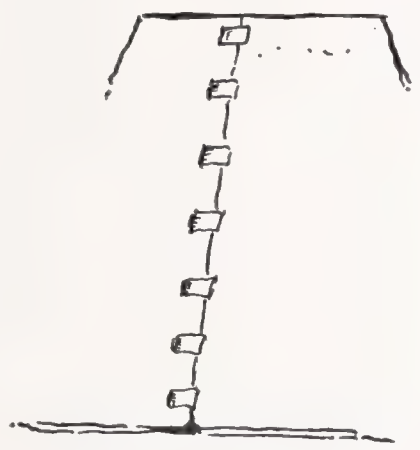
FIG. 9.

Some schools are in a position where hammered work in brass, copper, or lead could be introduced in an elementary way. For the hammered work it would be well to have an anvil cast in iron from a pattern similar in shape to Fig. 10. This should be about twelve inches long and about an inch and a half across the end, as in the end view of Fig. 10. The body of the anvil should be an inch and an eighth square. This anvil is made to go in a vise, and the metal is shaped over the ends by means of hammering, as in Fig. 11. The best hammer for starting a bowl-shape is made from an ordinary cattle-horn which has not been cooked. Into this insert a handle (Fig. 12), and this gives a strong, solid hammer which will not cut the metal. For finishing the work, a riveting hammer, No. 3, may be used (Fig. 13) but care should be taken to remove the sharp edge around the head and perhaps bevel the surface a trifle, and polish well, as this prevents the head from cutting the metal. It will be necessary to have heat for annealing the copper and brass, and for this purpose the foot-bellows and brazing pipe are the most convenient, as it will be connected with the gas. However, annealing can be done in a stove or furnace, if the work is done in the basement.

FIG. 10.

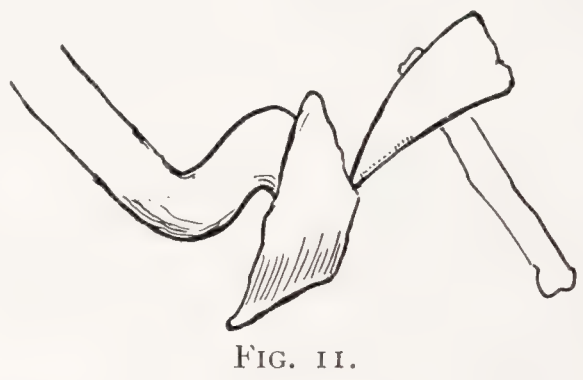

FIG. 11.

There are many possibilities in sheet lead, since it requires no annealing and can be hammered into trays and bowls readily, and even decorated by sawing (Fig. 5). In any case, whether using lead, copper, or brass, the first step is to decide on the shape and size, and then cut the metal, which should be about sixteen or eighteen gauge, in a circle, larger in diameter than the finished piece. It will take experience to know just how much the metal will stretch and how much larger to cut the material. Next draw a circle on the metal which shall represent the size of the bottom of the bowl (Fig. 14). Now hold the metal

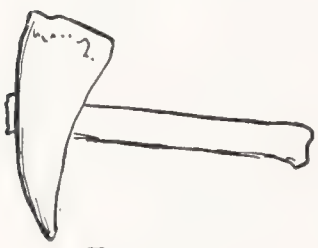

FIG. 12.

FIG. 13.

against the corner of the anvil with the left hand, in such a way that the edge of the anvil-head is directly under the line of the circle (Fig. 15). With the horn hammer strike the metal just above the line of the circle representing the bottom, and in this manner proceed around the entire circumference, striking near the line and turning the metal with the left hand. After having been around once, proceed again in the same manner, striking above the circle of previous blows; and in this way keep going around the metal until the outer edge is reached, taking care to cover every part of the surface with blows. In this way the metal is contracted and will have the appearance of Fig. 11.

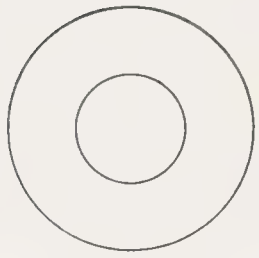

FIG. 14.

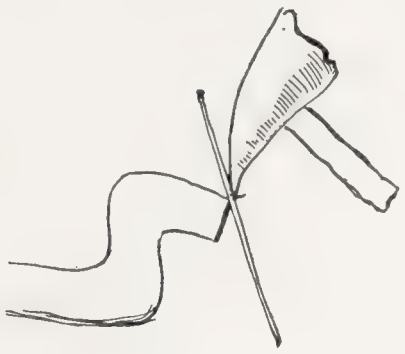

FIG. 15.

The metal should now be annealed by heating it to a red heat and cooling in water, after which the hammering process is repeated exactly as before, by beginning at the inner circle and working toward the outer edge. It will be necessary to repeat this hammering and annealing several times, until the sheet-metal is contracted to a circumference less than that desired in the finished bowl (Fig. 16). It is now possible to work from the inside and hammer the piece out into some shape like Fig. 17, for instance, or any simple form having very little shoulder. This can be done over a concave surface cut in the end grain of a piece of plank which can be held firmly in the vise. Up to this time the bowl has been in a rough state, being dented more or less by the blows from the horn hammer. These dents can be removed and the shape refined by using the riveting hammer previously described, and holding the bowl on the anvil as we did in the start. Now by hammering closely and striking every part of the surface, at the same time turning the bowl and fitting the shape to the various curves of the anvil, the form is refined similar to the original design. Care must be taken to remove all sharp corners from the hammers and anvils, and to polish them with emery paper, that the surface of the copper may

FIG. 16.

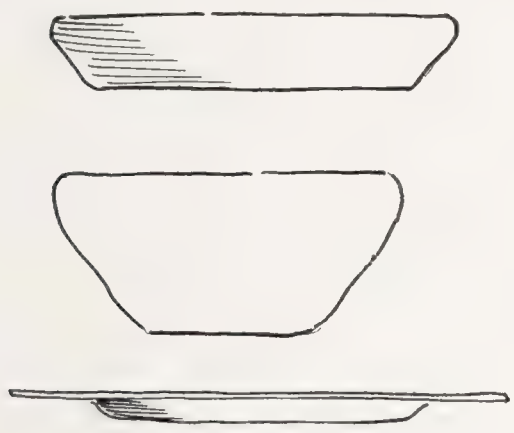

FIG. 17.

not be marred in the hammering. Now the edge of the bowl can be filed and any irregularities removed in this way. The last step is to clean the metal thoroughly, and this is done by heating and dipping in the acid-bath, then rubbing well with powdered pumice. If desirable, a fine color can now be obtained by applying to the bowl a slow, even heat, which gives colors ranging from orange to purple and blue. The hammered work can also be decorated with etching, sawing, and riveting, and this gives an unlimited field for work in a simple way.

In presenting these exercises in metal working, I have realized the fact that they will be useful only to those teachers who are progressive enough to go into the subject earnestly, and with study and experiment to work out a simple course adapted to the conditions surrounding them. The successful teacher in this line will ever be the individual teacher, unhampered by conventionality; the progressive teacher, striving for a high ideal; the intellectual teacher, combining art and industry, that the students may know the joy of adding a little of beauty and character to those humble objects that surround them in their daily lives.

THE MANUAL TRAINING KNIFE.

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THE terms "whittling" and "knifework" carry with them considerable meaning to those interested in educational matters. These terms stand for a system of manual training for children from nine to twelve years of age; a system that can be operated in the ordinary schoolroom without large outlay for extra room and equipment; a system in which the knife is the only cutting tool.

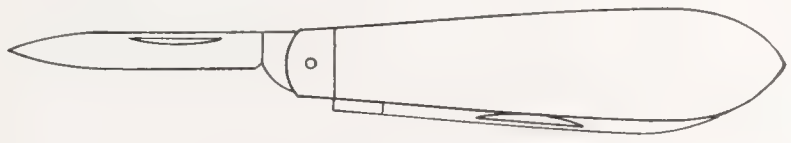


FIG. 1

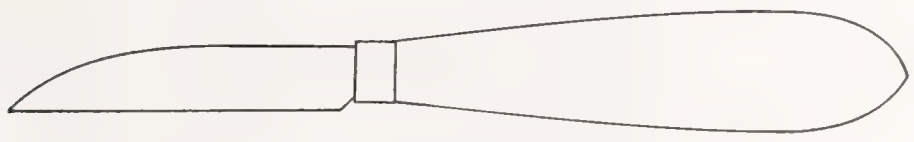


FIG. 2

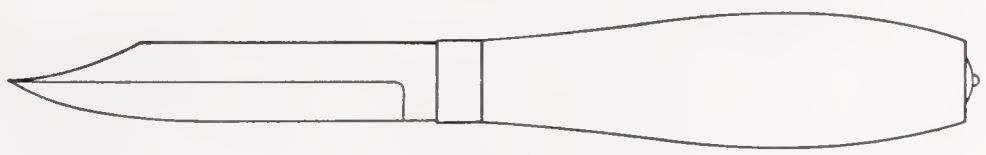


FIG. 3

My purpose in this article is to deal with this form of manual training only as far as regards the selection and sharpening of the knife. The knife should be selected with great care, no matter how extensive or how meager the rest of the equipment.

In selecting the knife there are a number of points to be considered. The quality of the steel should be of the best, and the blade carefully tempered so that it will hold a keen cutting edge. If the temper is too hard the edge will nick and break, and if too soft the edge will turn over, giving a great deal of trouble and doing poor work. The construction of the knife should be good, and the design such that it is well adapted to the work to be done and to the capacity of the user. There are a number of styles of knife which are used for this work: the ordinary two-bladed pocket-knife, or jack-knife, Fig. 1; the round-

handled knife with the fixed blade, Fig. 2 ; the sloyd-pattern knife with a flattened handle and a fixed blade, Fig. 3. Of these three styles of knife the sloyd-pattern seems to be the best adapted to schoolroom work. The pocket-knife has the disadvantage of closing. This is not desirable in a school knife, as it makes it easy to slip into the pocket.

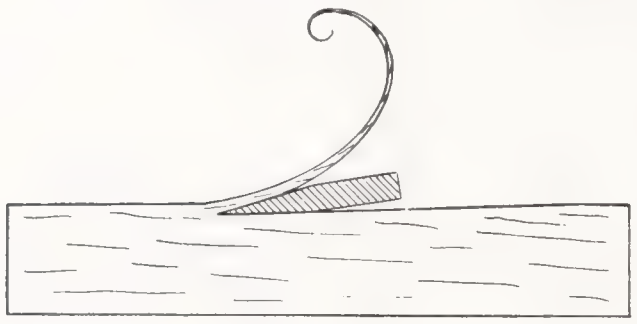


FIG. 4

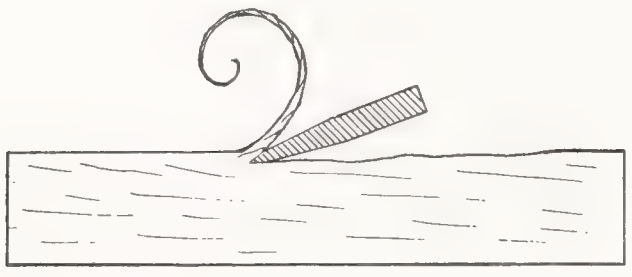


FIG. 5

No temptation should be offered to take the knife from the schoolroom, either by accident or design. Another objection to the pocket-knife is that the blade has a thin edge, making it hard to keep in order. The second form of knife has a wide blade, ground from the edge to the back, making it very hard to whet properly. The blade of this style of knife is fastened to the handle by being driven into it. After a short time the blade gets loose and pulls out. In the sloyd-pattern knife most of the objections to the foregoing styles are overcome. This style of knife will not close up ; the blade has a thick, strong back, and is ground from the edge to the center, insuring a strong cutting edge ; the point of the blade is strong and centrally located ; the blade is fastened to the handle by a tang, which runs completely through and is riveted on the end, thus holding it firmly in place. These knives are made in several sizes, but the most suitable one, for young workers, is the size with a two-and-one-half-inch blade. This knife is large enough for all school work, and is well suited to the use of little hands. A great mistake is made in selecting too large a knife. A large knife is clumsy, and in making small concave cuts, where the point must be used, the fingers are apt to close upon the edge of the blade and get cut.

It has been said that if boys are given their choice they will choose the large knives. If such is the case, their reason probably is that, in their eyes, the large knife stands for more — it has a more formidable appearance ; they think they are getting more for their money — and not because they have any clear idea of the adaptability of either size to the work which they are going to do. The teacher is the best judge of that. As the result of a number of years' trial the sloyd-pattern knife of small size seems to meet best the requirements of a school knife.

When the knife first comes from the maker it is not in condition to do good whittling; it has what may be termed a commercial edge; that is, the edge is ground quite bluff, so that it will not be easily damaged while in stock. The first thing before using the knife is to whet it to a thin keen edge. The proper way to whet a knife is to lay the blade flat on the whetstone and whet a straight bevel from the edge to the center of the blade. The very appearance of a knife so sharpened carries with it the idea of keenness and cut. In the sloyd-pattern knife this gives a wide bevel and at the same time, on account of the thickness of the blade, insures a strong edge. In whittling with a knife whet in this way the bevel forms a support for the blade, and a shaving can be taken off while the blade is still in contact with the wood the whole width of the bevel, thus insuring a straight cut (Fig. 4).

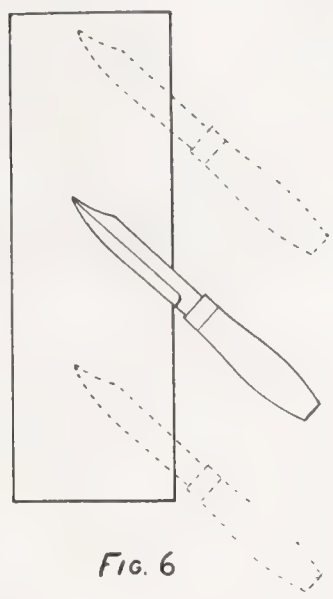


FIG. 6

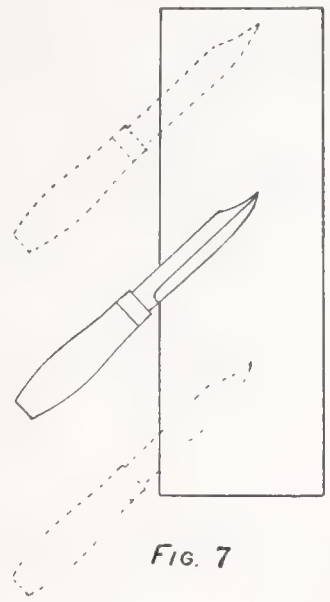


FIG. 7

Some advocate the whetting of a narrow bevel on the edge of the knife, thus making a double bevel — the one at which it is ground and the one at which it is whet. With the knife so sharpened, the blade must be tipped up in whittling, in order to bring the edge in contact with the wood; and it must be held in that position throughout the entire cut with no support except the narrow bevel. Under these conditions the tendency is for the edge of the blade to gouge into the wood, resulting in a wavy, uneven surface (Fig. 5). A skilled workman would not think of whetting a bevel on the back of his chisel, but if he were to do it the result would be similar to the knife whet with the double bevel.

In whetting a knife learn to whet with both the right and the left hand, always keeping the edge of the knife toward you. Do not place the blade at right angles with the stone, but at an angle of about forty-five degrees, with the point away from you. Rub back and forth the full length of the stone, not in circles (Figs. 6 and 7).

A good oilstone is an absolute necessity. The India oilstone of medium grade will be found to give the best satisfaction of any stone on the market.

Whet the knife on one side until you can feel, by running your finger over the opposite side, that the edge is beginning to turn or rough up, then whet the other side until the edge turns back. This rough edge is called a wire edge, and shows that the edge is whetted down very thin. The wire edge must be removed by strapping. Take a piece of belt leather, or sole leather, and glue it to the top of your oilstone box or to a board. Coat the surface of the leather with flour emery and oil—just enough oil to make the emery into a paste. Rub the knife the full length of the strap, drawing it away from the edge, and turning it over at each stroke. The wire edge will soon be gone, and a keen cutting edge be obtained, with which the finest shavings can be removed.

By following these suggestions a good knife can be selected and put in good order. Good work will be the result.

ST. IVES AND THE NEWLYN CRAFT SCHOOL.

FRANK FORREST FREDERICK,
University of Illinois.

It is known to readers of this MAGAZINE that Professor Frank F. Frederick, of the University of Illinois, is making the best of a sabbatical year by studying art and the crafts in England and France. He spent the autumn months at St. Ives and Newlyn painting landscapes and gathering material for a course of lectures; the winter months, in London's famous schools studying etching, pottery-making, modeling, and bookbinding; and the spring months are being spent in Paris. We have received several characteristic letters from him, from which we have been granted permission to publish extracts, provided we make it clear that they are "unbluepenciled ramblings extracted from personal letters." The following word-pictures of St. Ives and Newlyn will interest many of our readers.—EDITOR.

YES, St. Ives is the place. The bay is something the shape of a figure 3, and we live on the high headland in the center, overlooking the entire bay and directly into St. Ives harbor about a mile away as the gull flies. As you approach the town, either by the railway, or by the highroad which follows the crest of the hills, or by the more interesting coast-guard path that trails its way up and down, in and out, all along the coast, you come upon the most quaintly situated town in Cornwall. You literally drop into the town from the bluff, and find it crowded upon a narrow and low isthmus connecting the main land with a rocky hill. It's the quaintest of fishing villages, with its narrow streets and old stone houses, white- or pink-washed, with the basements tarred, and all crowded in endwise and crosswise—any way to be there. Some have their front door a few steps up, some a few steps down, and a few on the level of the street, and all just as they have been while generation after generation of St. Ives men have been born and died. When the tide is high the harbor is full and the waves break against the churchyard wall, drenching the windows with spray. It comes clear to the walls of the houses and dashes against them even in the summer gales. A narrow lane runs the length of the town, and this is the leading business street, and all around branch off obscure openings into regular labyrinths of narrow, crooked, dark, roughly-paved lanes, passage-ways, and courts.

Even more interesting than the streets themselves are the glimpses into court-yards, sail-lofts, and fish-cellars. Here old men and the women are mending the nets and baiting the hooks for the next

night's fishing. Eyes, nose, everything tells us that this is a fishing village—everything has to do with the work.

I should like to show you around St. Ives! We might come across the town crier with his bell, and we should think we were part of a very interesting story-book. The interiors, as well as the exteriors, of the houses are very paintable, and are almost always as clean as much sweeping and polishing can make them. Every self-respecting family has a glass globe of wax flowers and a stuffed sea gull in the best room, and on the tops of sideboards, etc., and on shelves are always a fearful and wonderful collection of glass and crockery. I hired a room for a week, and before I could find room to lay my traps about, the owner removed no less than thirty examples of still-life.

The harbor front is the Rialto of the place. Here the old men gather and talk of voyages to distant ports, and the fishermen overhaul nets or loaf while waiting for the tide to turn, and the women of the town bring the family washing to dry upon lines strung from boat to boat. A number of old sail-lofts along this harbor front have been made over into most picturesque studios.

There is no school of painters here, but one of the largest, if not the largest, colony of painters in Europe (outside of the cities, of course). Material, climate, cost of living, etc., unite to make this a paradise for painters. Lots of men I have read of and thought of as living in the clouds are living at St. Ives on a limited number of shillings per week.

I have been out to Newlyn several times. When George [youngest member of the Frederick family] writes a letter, he begins near the center of the page and shoots out and across and up and down with vigor and variety. The resulting labyrinth might pass for a map of Newlyn any time—especially if you cut a half-circle out of the side of the page to represent the harbor. It was a "catchy day" when first I penetrated into the odors of Newlyn, but the sun soon "broke abroad a bit," so I did not need my umbrella, which I could not use anyway in many places, as the streets were so narrow. Those streets! narrow, crooked, dirty, and picturesque in the extreme; Newlyn is a "proper fishing village." It was not in Newlyn, however, that I had to dodge a fish-head thrown into the street. That was in St. Ives, but had it happened in Newlyn, it would not have been noticed, being but one more in the general collection.

If I were a professional landscape painter, I know I should jump off some headland in sheer despair, but, as it is, I feel sort of dazed.

To light upon or into this most quaint corner of England after the rawness of Illinois is going from one extreme to the other. There is nothing raw here — everything having been cooked and dried up some centuries ago, and it has not changed since. They speak here of "going to England."

Well, I wandered along in Newlyn like one in a dream — jostled by the fishermen in red canvas trousers and blue sweaters, and the fisherwives with their great baskets, and endeavoring not to step on the little donkeys who provide the local rapid transit, and trying to look both ways at once, when I saw over a green door in a mossy wall, a sign reading: "Industrial Class." "That's me," said I; "let's see what manual training is in fishiest England!" On one side of the street was a solid wall of houses with the entrances to side streets through tunnels, and on the other a row of fish-cellars, some one and some two stories high, all built of great irregular stones. There are no openings to the street in these fish-cellars except the door, and I gazed some time at that particular green door before venturing to rap. At this point an ancient dame, in a high-water skirt and hob-nailed shoes, who was polishing up the brasses of the small front door, made some remark in pure Cornish, the purport of which was that I should go in; and so I did and learned what a fish-cellar looked like: Sheds in a hollow square, with a small open court-yard. In the sheds the cleaning and curing operations are carried on, and in the lofts above, reached by a ladder, nets, etc., are stored. Another door opens upon the harbor side. There was a terrific din of pounded metal, and so I knew that I had stumbled upon the craft class of Newlyn.

Some eight or ten years ago some of the artists here started a fret-sawing class, and soon had a crowd of brawny youths sawing out all sorts of things. This was soon given up for metalwork, but to this day it's the "fret class" and always will be. In a year or two it was found, as we shall find in our public schools, that manual training as busy work was a mistake. They had no difficulty to find boys willing to pound metal, but they went at it as if calking a lugger, and the waste of good material was appalling. Out of this beginning an industry has developed giving steady employment to five or six of the best members of the class. Their work sells to the tourists here as well as in London. If a youngster of the town feels that he would like to try the work, the foreman — one of the original fisher-boys — gives him a chance, and if his work is up to the standard, it is put on sale, and the boy given further instruction and help. Wish I could pass myself off as a fisherman!

They do the sort of thing we see illustrated in the *Studio* and it's all of a nautical character. Borders of shells, seaweeds, and fish-ships, luggers, etc.— idealized in the style of the "Royal George" and the vessels of the Spanish Armada. Any boy in Bradley Polytechnic could draw as well, but the spirit to be seen in this work would be lacking. Some of it is fine—worked only as heirs of generations of men whose lives were filled with sights and sounds of the sea can work.

ASSOCIATIONS.

DEPARTMENT OF SUPERINTENDENCE.

THE Department of Superintendence of the National Educational Association held its annual session at Cincinnati, O., February 24–26 inclusive, there being several hundred members in attendance. Perhaps the most significant feature of an exceedingly rich program, in which some of the leading school men in the country participated, was the prominence given manual training in the discussions. Not only were the topics programmed in this direction carried out, but many of the papers upon other topics seemed to be colored by the handwork thought. Indeed, one might have mistaken the meeting for a manual-training conference, conducting its business in several sub-conferences.

The session was opened by a review of Professor W. M. Davis's paper upon "The Human Side of Geography." In his review Superintendent Lloyd E. Wolfe, of San Antonio, Tex., showed that there was a strong tendency toward the study of industries. This thesis was maintained: Geography in the grades should include the study not only of the earth's surface and the distribution of raw materials, but "the industrial processes that deal with commodities." Food, clothing, and shelter should be traced to their sources, and the steps through which they have been developed to meet the human social needs should be studied. These questions would then arise: (*a*) Whence come the articles that make toward man's well-being? and (*b*) What are the industrial steps that produce these commodities?

"Human well-being," said the speaker, "is the well spring of human interests and human activity." It was held that instruction in geography in the grades should be based on an understanding of the forces, relations, and facts of human life.

In discussing this paper, Superintendent W. H. Hatch, of Oak Park, Ill., supported the general stand taken. He emphasized the fact that the motive with which the pupils approach the study is the important element in character-building.

Jacques W. Redway, of Mount Vernon, N. Y., gave as his definition of geography the "study of the earth as the home of man and the study of man in his struggle with his environment."

On the afternoon of the opening day Professor E. W. Coy, of Cincinnati, spoke on "A Readjustment of the High-School Curriculum." The speaker advocated a course six years in length. In the discussion which followed, Superintendent Edwin G. Cooley, of Chicago, said that of all the high schools in his city the best was a school that was continuous from the kindergarten to the twelfth grade, and where manual training was given in every class. The speaker advocated one or two years of manual training, on an elective basis, for every high school in the land.

Superintendent F. Louis Soldan, of St. Louis, held that the high school, as it is, is far behind the graded school as regards pedagogical thought and practice. It is through better pedagogics that the readjustment of the high school is to be reached. Professor Charles DeGarmo, of Cornell University, in answering Superintendent

Soldan, named several books of a high pedagogic order, bearing directly upon secondary-school work.

On Wednesday at 9:30 State Superintendent Alfred Bayliss, of Illinois, read a paper upon

"INDUSTRIAL EDUCATION IN RURAL SCHOOLS."

Mr. Bayliss spoke of the work being done in the Cottage Hill School in Sangamon County, Ill., where Mr. H. C. Pruett is the teacher. This instance was mentioned to show some of the possibilities of industrial education in the country.

In one corner of the basement of this school, which extends under about one-third the entire house, is a small workshop. The equipment comprises a substantial carpenters' bench, a vise, the more common hand tools, and a lathe. This school is composed of thirty-three pupils, ranging from six to eighteen years of age, and covering all grades. The pupils use this shop both in and out of school hours, and produce many things of value for the school and the home. In addition to this work, an agricultural collection has been made; a school garden is kept up; various seeds and grasses are experimented upon; sixty-five specimens of woods have been collected.

The pupils of the school received $290 in premiums for exhibits made at a state fair recently held, and this money has been expended in equipping the library (185 books) and purchasing tools, chairs, tables, pictures, matting, rugs, wall paper, and jars and cases for specimens, etc.

Superintendent Bayliss believes that the country-school teacher is taking his cue from the teacher in the town. The former is willing to try anything giving promise of results. That the near future will see many such schools as the one mentioned, is the belief of Mr. Bayliss.

Work done by the pupils was exhibited. The economic phases of the subject were touched upon, and the fact that the pupils worked for the good of the entire school. Here the social spirit is cultivated, the each-for-all idea being brought out. The study necessary in the proper expenditure of the $290 was in itself a valuable one. That trustees and patrons think well of such work is shown in the fact that it is proposed to complete the basement excavation, and the pupils will then furnish the same with lunch tables. The gardens are cared for during the summer by a resident of the neighborhood.

Mr. Bayliss believes that any "waking-up process" in rural schools is justifiable. The chief drawback is the limited supply of teachers. A broad training experience is of more value than a knowledge of industrial education. There is no good argument against the country school taking up industrial work. What is drudgery at home, on the farm, is pleasant and instructive in the school garden. The school has several interests; the home but one. The collecting of minerals, study of soil manipulations, fertilizing, time of planting, labor problems, marketing, and like topics, can be taken up.

Farmers' boys' experiment clubs should be formed, and the experiment and agricultural schools visited; prize crops may be raised, and plans for school grounds and gardens drawn. The neighboring farmers will visit the school to see any new varieties that may have been produced, and the landscape and fruit garden will be an object lesson to the community.

The hope was expressed that to the bench work in such schools, including the making of useful objects and mending of farm implements, etc., would be added work in leather, mixing of paints, and the like. Weaving, sewing, clay-modeling, also have

a place. Boys may be given opportunity to cook and sew if they desire, while girls may have the privilege of working at the bench.

In opening the discussion of this paper ex-Superintendent L. D. Harvey, of Wisconsin, spoke of the hindrances to good work in the country school and said that a study of agriculture, manual training, and domestic economy would challenge the attention of country people. Topics such as the treatment of worn-out soils, enriching, etc.; study of seeds, of animals, of accounts; manual training and the use of tools on the farm; architecture; home economics and home-making for girls — these have much value in the country school. The study of Farmers' Bulletins and the establishment of reading clubs on architecture and domestic economy should be encouraged. In short, industrial education is the key to the improvement of the rural schools, and the desired results can be more quickly brought about through the establishing of agricultural schools.

State Superintendent W. W. Stetson, of Maine, made a valuable contribution to the discussion. He spoke of the schools in a section of northeastern Maine, and distributed pamphlets of text and cuts bearing on the industrial work now being done in the one hundred and ten schools of this district. School grounds and gardens are kept up; carriages and wagons are repaired; a blacksmith kit is provided at each school; looms and spinning wheels are used; tools and implements are mended. Such work tends to make "common people uncommonly useful." Superintendent Stetson believes each school should have a small room for manual training, and one for cooking and sewing, separate from the school building.

At 2 P. M. on Wednesday Dr. William O. Thompson, president of the Ohio State University, spoke upon the topic

"TO WHAT EXTENT AND IN WHAT FORM SHOULD THE MANUAL-TRAINING IDEA BE EMBODIED IN PUBLIC-SCHOOL WORK?"

President Thompson emphasized the necessity of educational rather than trade training in the public schools. A training "in experience" rather than "for experience." The remarks of the speaker seemed to point in the direction of the old psychology when he spoke of accuracy, attention, judgment, and observation being "the alphabet of manual training." The trade idea was characterized as being too narrow for our consideration here. The proper correlation between mind and body is absent in many college boys. They should have mechanical work with tools, and that under competent teachers.

The following points under the general topic should receive consideration:

1. The introduction of manual training will open the way to lengthen the school day. The time from 3:30 to the close of the day should be employed.

2. Manual training should be made continuous from the kindergarten to the close of public-school work. There is no limit, so far as the completion of the subject is concerned.

3. The expense coupled with handwork, when compared with that necessary to carry on the general sciences, is not large. An equipment need not necessarily be complete at first, but may grow gradually. In some instances elementary drawing may be the only work given at the beginning.

4. The teacher is the chief item of expense the first year. As to the form of the work, it is not necessary to carry out a certain set program or to accomplish a given amount.

Dr. Thompson placed great emphasis upon the proper teaching. The chief issue to consider is that of local conditions. The needs of the community must be held in mind. The future will take care of the place of the subject in the curriculum. The work should not be undertaken until the teacher is ready to carry it on.

In the absence of State Superintendent Nathan C. Schaeffer, of Pennsylvania, the discussion was opened by E. W. Walker, of Delavan, Wis. The speaker did not consider it necessary to carry on manual training in the country schools. He alluded to his own experience as an illustration that on the farm the tools and implements are repaired by the boys; sewing and housework furnish employment for the girls. In towns and cities the educational rather than the trade idea is essential.

The speaker that followed took the ground that all children, in city and country alike, should receive motor training. The farm does not offer the proper conditions. Manual-training schools should be supplemented by technical schools.

Mr. George H. Martin, of Boston, said that in the evolution of society, children are taken out of touch with things and people. Through manual instruction we shall bring back the opportunities possessed by the child of a half-century ago. Certain lines of work were spoken of, such as had been tried in rural villages. This work should harmonize and correlate with child life. The school garden appeals to the nature side; the history and the thought of primitive peoples are worked out through basketry, weaving, and pottery, decoration being done in connection with the art work; the study of the log-house and the making of furniture, wall paper, and rugs bring the child into touch with the industries.

The next speaker thought we could so simplify our school work as to reduce it to two R's — the acquisition of knowledge and the expression of knowledge. A plea was made for the dignifying of labor and for the justification of manual training and domestic science.

Superintendent Charles H. Cole, of Martinsburg, W. Va., asked President Thompson the objection to teaching the rudiments of an industry in connection with industrial training. In reply Dr. Thompson insisted that the educational work and not the trade feature must be given attention, as all public-school pupils must be treated alike, the teaching of crafts being left to special institutions.

PRESIDENT ELIOT'S ESTIMATE OF MANUAL TRAINING.

In his address on Wednesday evening upon "How to Utilize Fully the Plant of a City School System," President Charles W. Eliot, of Harvard, spoke strongly of the part handwork should play in education. President Eliot brought out the value of vacation and evening schools, and went on to say of manual work: "I believe there is as much mental training in manual work as in any book whatsoever," and again: "I believe there is more value in manual work than in nine-tenths of the arithmetic given in the schools."

President Eliot also thought that as a moral factor manual training was most beneficial. Automatic action needs the relief of free play. When you have careful, persistent working for a good end you have moral training.

On Thursday at 2 P. M. Professor Charles R. Richards, director of the department of manual training of Teachers College, New York, presented an exceedingly strong paper on "Some Practical Problems in Manual Training." This paper is published in full elsewhere in this issue.

Mr. Gustaf Larsson, of the Boston Sloyd School, discussed this paper. He

believed in the educational rather than in the economic or technical point of view. It is not the province of manual training to further the other school subjects, but to lend itself to the development of child life. The child rather than processes should be studied. If we use manual training to supplement other school subjects the former will be weakened. After touching upon the qualifications necessary in a teacher Mr. Larsson spoke of the sloyd as being a line of work where effort and action were stimulated by human interest. Skill is not the ultimate object of the work, but skill is desirable. European boys were declared to be superior to American boys in rapidity and execution of work and in the confidence they possessed of their own powers. This the speaker believed due in part to the fact that the tools and materials used by European boys are much cruder than those in use in our country. The history, work, and significance of the Boston Sloyd School were spoken of.

While to those of us who are trying to further the idea of rational handwork in the schools the attitude of the Cincinnati meeting was most gratifying and meaningful, there may still be another side of the question. Perhaps too much time was given certain phases of the general topic. In this day it is entirely unnecessary to dwell upon the reasons for introducing such work. The "why" side of industrial education need not be again dragged before educators. There seemed to be a disposition also on the part of some taking part in the discussions to be led away from the real issues as brought out in the papers. When vital problems are being discussed at such a meeting the participants should see to it that they hold themselves to the questions in hand.

The rural-school problem being, as it is, such a fundamental one at the present time, much good will likely result from the Cincinnati meeting.— ARTHUR HENRY CHAMBERLAIN.

THE SCHOOL CRAFTS CLUB.

THE second stated meeting of the School Crafts Club of New York city was held at Hotel St. Andrews on Friday, January 9. The committee on admissions presented the names of three candidates, who were unanimously elected. The by-laws were amended by a clause providing that the president be at liberty to invite as guests of the club those distinguished in the fine or applied arts whom it might be desired to have discuss the papers presented at any meeting.

Officers and standing committees were elected as follows: President, James P. Haney; vice-president, Charles R. Richards; secretary, George F. Stahl; treasurer, Walter M. Mohr; committee on program, William F. Vroom, Walter S. Goodnough, Robert G. Weyh, Jr.; committee on admissions, Edward D. Griswold, Frank T. Collins, Victor I. Shinn; committee on entertainment, Arthur W. Richards, Albert Garritt.

A number of interesting specimens of work were on exhibition. Mr. E. D. Griswold showed a cheese-grater invented and made by an Italian boy of an ungraded class, who, a year ago, was unable to draw a straight line by a ruler. The remarkable development of muscular control and reasoning power in the boy was attributed largely to the beneficial effects of manual training. Some clever work in brass and leather, including calendar backs, card-cases, bags, hinges, escutcheons, etc., was displayed by Mr. V. I. Shinn, of the Brooklyn Manual Training High School.

Mr. R. G. Weyh, representing a committee of manual-training teachers of the public-school corps, submitted a list of books recommended for the use of teachers.

The list comprised works on manual training, theory and practice, forestry, carpentry, bent-iron work, basketry, weaving, etc.

Mr. A. H. Chamberlain, author of the latest bibliography of manual training, being asked by the chairman to speak on this topic, remarked that he approved of the plan of recommending the best books for the use of teachers. He thought the committee's selections were, for the most part, good. It was much to be desired that the grade teachers should be more interested in manual training and have a better knowledge of the subject, and one of the best means of accomplishing this end was the placing of good books in their hands. The progressive teacher would be thankful for the suggestions offered by this committee.

Apropos of the paper presented by Mr. Weyh, it was suggested by the president that members contribute information relating to books or other matters of interest for the benefit of the club.

"The Industrial Library" was the topic of a brief discourse by Mr. A. W. Richards. This will appear in full in a later issue of this MAGAZINE.

Professor A. V. Churchill, of Teachers College, spoke on "Definite Principles in Art Teaching." It might be laid down as the first principle in construction that function dictates form to a great extent. Form is also influenced by the material used. The second principle may be described as artistic emphasis. A doorway, for example, is not merely a hole to go through. The architect takes pains to emphasize the shape of the door so that it may be more easily apprehended. This leads to a feeling of pleasure. The characteristic features of a building are emphasized, so that we may see from a distance what it is, as a church or a library. The cornice emphasizes the top of the wall. This leads us to see, as we look up, that we have reached the top — the wall stops and the roof begins. Any decoration on a picture frame which distracts the eye from its function reduces the æsthetic quality of the frame. We have here two principles which may be reduced to intellectual statements. All arts have one basis in common. They appeal to some sense and afford exercise to that sense. A child first makes a noise; this appeals to his sense of hearing. Then he produces regular sounds; this is the beginning of his appreciation of order, and appeals to the intellect. The perception of order and relation in shapes and colors in anything we see gives pleasure. The perception of a consistent variation in size also produces pleasure; thus an oblong book is more pleasing than a square one. Variety, or change, is a condition of sensation. That which does not vary is dead. But variation must be consistent. Two inches by ten would not be a good shape for a book because the dimensions would be too difficult to relate. In language we have modulation. Emphasis is placed on the more important words, but not too much emphasis. So in design we desire variety, but it must be introduced in moderation. In teaching art we must understand principles. It is only when we can get at principles that we can teach anything.

Mr. Louis G. Monté, of Teachers College, discussed the question of adapting principles to practical use. Variation, consistency, and emphasis he regarded as fundamental principles. We must begin with something definite. Constructive and other principles have been used in the works of the great masters. In the works of modern artists it is hard to find the things we are after. Mr. Monté exhibited several pictures illustrating consistency and variation in space division. Strong horizontal and vertical lines were frequently observed indicating centers of interest. Some students' work in clay was shown, one piece being a box with strong line divisions introduced. Other models were shown as examples of the application of principles.

Mr. Frank A. Parsons heartily indorsed what had been said on the application of principles in art teaching. He desired also to emphasize a text which Mr. Weyh had given us: "The hands express what is in the mind and heart;" and another from the remarks of Mr. Richards: "Knowledge is born of experience." Knowledge of principles is necessary for both teachers and students. Knowledge is not the same as information. A child must live every step he takes in order to have knowledge. He should have, not only something to do, but also some reason for doing it. To begin by learning rules, tables, etc., instead of doing something is a wrong method of education. In manual work there is a pictorial side and a practical side. The first exists alone for decoration, the second deals with right construction. There is a beauty in decoration and also a beauty in correct construction. Children should be trained in neatness and good arrangement in writing papers, as in arithmetic, English, etc., for habits are the result of oft-repeated acts, and correct habits are vital. Specimens of children's work in these lines were shown. Some small rugs woven by students were shown and the designs analyzed, examples of pleasing emphasis and consistency being pointed out. Mr. Parsons concluded with a plea for the consideration of the child in all school work. The life of the child should be touched by everything he makes, and beauty should be emphasized so that he may get more out of life.

At the close of the discussions Mr. A. W. Richards contributed to the entertainment of the club by exhibiting a series of lantern pictures illustrating the development of motor activity in a healthy boy of some three years of age. One view, showing the subject seated in an express cart, Mr. Richards described as "the child expressing himself."

The evening's proceedings concluded with refreshments and social conversation. — WILLIAM F. VROOM.

CALIFORNIA STATE TEACHERS' ASSOCIATION.

A LARGELY attended meeting of the California State Teachers' Association was held at Los Angeles during the holiday vacation. One of the "drawing cards" of the general sessions was Booker T. Washington. As a body, teachers are in a position to realize what this great "man with a mission" is accomplishing for his race.

The department sessions were also well attended, one of the most interesting being the manual-training section. It was encouraging to have so many grade teachers and outsiders present. President Walter A. Edwards of Throop Polytechnic Institute occupied the chair, assisted by Mr. Claude A. Faithful, as secretary. Miss Mary F. Ledyard gave a paper on "Manual Work for the First Grade." She voiced the sentiments of the majority present in championing the use of raffia as a medium for manual training in the first grade. Professor E. E. Brown of the University of California read a paper on "Manual Training in the Secondary Schools; A Cultural or Vocational Subject." This brought out much discussion. Professor Brown held that vocational training is just as dignified as any other training, and that it might be possible to hold the two ideals together in a liberal education. Manual training could be taught as a vocational subject and still not lose any of its educational or cultural value. President Butler's familiar epigram was quoted very appropriately: "The world does not need narrow men, but broad men sharpened to a point." Manual training must not be ruled out of cultural subjects of education; at the same time some sort of distinct vocational training is needed to prepare men and women to

become honest bread-winners. The general trend of thought in the discussion was that the cultural feature of manual training was not impaired in any degree by its being made to serve vocational ends.

Superintendent T. H. Kirk, of Santa Barbara, gave a most encouraging paper on "The Future of Manual Training." He said: "In the future the formative side of manual training will not be so much a matter of chance as it is now. I do not mean to say that manual tasks will be measured in definite products of self-reliance or other good habits; but I do mean to say that the formative results will always be conscious motives guiding the teacher in a logical choice and handling of tasks. Indeed, the pupils themselves will come in some measure to be guided by formative motives when self-active.

"The work must more and more have bearings upon the pupils' present life. The doctrines of interest and apperception both demand this. As one has said, we are 'to make him happy now that we may make him happy twenty years hence by the very memory of it.' Childhood should not be a struggle for manhood and womanhood, but for itself, that we may have manhood and womanhood later. In other words, childhood has its own social and economic bearings on life, and to meet them manual training must not be the meager thing it is now."

Miss Mary L. Gower's paper was on "Experimentation by Pupils in Domestic Science" and considered the problems of relationship between the home and the school. The object is to secure that co-operation of the home problems and cookery lessons which will lead to independent work and self-expression. This will result in capable and efficient work in the homes.—CHARLES H. THORPE.

NEW YORK STATE ASSOCIATIONS.

FOUR state associations of teachers met in Syracuse, N. Y., during the last three days in December. These were the Associated Academic Principals, the New York State Council of Grammar School Principals, the State Science Teachers' Association, and the New York Training Teachers' Conference. Manual Training was given a place on the program of each of these organizations.

In the Training Teachers' Conference Superintendent Charles B. Gilbert opened the discussion of the question, "Inasmuch as the material forms of expression are essential features of modern school life, should not elementary manual training be a necessary part of the professional training of a teacher?" This was answered in the affirmative.

The academic principals listened to Mr. Vinton S. Paessler, of the Barlow School of Industrial Arts, Binghamton, talk on "Manual Training in Villages and Small Towns." He emphasized the value of thoughtful action to the individual and the nation, and the present need for noble, active men and women who are strong and capable.

He then referred to a "business questionnaire" prepared by a special committee of the New York State Teachers' Association. Four hundred and nine prominent and successful business men, merchants, and bankers, of New York and neighboring cities, answered these questions: "Do the New York public schools prepare children to earn their living, and how can instruction be improved to this end?" Mr. Paessler then quoted from their report as follows: "If we adopt 60 per cent. as the satisfactory standard, we shall find that, judging by the returns, boys may be classi-

fied as follows: Satisfactory in truthfulness, 66 per cent.; cleanliness, 65 per cent.; desire to advance, 60 per cent. Unsatisfactory in reliability, 56 per cent.; punctuality, 56 per cent.; manners, 54 per cent.; ability to follow instructions, 53 per cent.; economy of time, 32 per cent.; industry, 50 per cent.; and economy of materials, 35 per cent. The city-bred boy did not succeed as well as the boy from the country." Continuing, the speaker said: "These general defects are noted: lack of mechanical or manual training, accuracy, economy, thoughtfulness, carefulness, system, attention to detail, self-initiative, etc." This report clearly shows that our schools are strong or weak just as they succeed or fail in their great and responsible task of giving a competent introduction to the duties and privileges of life.

Later in his address Mr. Paessler expressed the opinion that "in the consideration of manual-training work for villages and small cities, too much has been made of the difficulties, and too little of the possibilities." He would have it found, in its essential elements, in every city and village.

At the Science Teachers' Association Mr. O. C. Kenyon, of the Syracuse High School, read a paper on "The Physics Machine Shop in Secondary Schools—Its Value, Equipment and Management. How to use it and benefit a class of pupils in the making and repairing of physical apparatus." Mr. Kenyon had several pieces of physical apparatus, made by his boys in the well-equipped shop connected with his laboratory. Those who stood highest in their other work were allowed to do this work in the shops. He pointed out the need of sharp tools and the need to teach boys to sharpen their own tools, as dull tools are the first element of failure. Emphasis was placed on the proper use of tools as necessary to accuracy in the work done by them. Drawing had its place in his work in connection with model-building. Joinery and wood-turning also found a place in his shop. Chipping and filing and sheet-metal work were very necessary and the study of developments in drawing were necessary to the work in sheet metal. It was pointed out that pupils liked to make tests with the apparatus which they made; also that it is an inspiration to the pupils to preserve and exhibit work made by themselves.

At the Grammar School Principals' Council "Manual Expression as a Means of Mental Growth" was made one of the topics for discussion.

It was evident in the meetings of all four of these organizations that the problems of manual training were receiving thoughtful consideration.

NEW ENGLAND ASSOCIATION OF TEACHERS OF METAL WORK.

THE ninth semi-annual meeting of the New England Association of Teachers of Metal Work was held in Boston November 28 and 29. About twenty-five members were present. Small parties were made up who visited some of the various manufacturing establishments which had expressed willingness to receive the men of the association. Among the places visited on Friday were the works of the East Boston Forge Co., at East Boston; the plant of the Jupiter Steel Co., Everett; Crosby Steam Gauge & Valve Co., East Somerville; U. S. Navy Yard, Charlestown; Waltham Watch Tool Co., Waltham; and the U. S. Arsenal, Watertown. Saturday forenoon was spent visiting the new home of the Brookline Manual Training School, Holzer-Cabot Electrical Co., and the Metropolitan Pumping Station.

The annual dinner was held at the American House, and was followed by a business meeting, which was addressed by Professor Paul H. Hanus, of Harvard

University, and Superintendent Marsh of the American Waltham Watch Co. Professor Hanus spoke of some of the hurtful tendencies of modern educational methods, giving causes and suggesting remedies that are within the reach of each one of us. His talk was hopeful and helpful. Superintendent Marsh gave us the history of the adoption of the metric standard by his company, and illustrated his talk by showing various gauges and measuring machines that are reference standards in their shop.

Following these talks, W. C. Holden, of the Public High School, Hartford, Conn., was chosen president of the association for the coming year; F. E. Mathewson, Mechanic Arts High School, Springfield, vice-president; and B. A. Adams, of the same school, secretary.

The spring meeting will be held in Springfield, Mass.—BURTON A. ADAMS.

BREVITIES.

THE following statement concerning the meeting of the National Educational Association in Boston next summer has been received from the president of the manual-training department, Principal Charles F. Warner of the Mechanic Arts High School, Springfield, Mass.:

The forty-second annual convention of the National Educational Association, which is to be held in Boston, Mass., July 6–10, is certain to be the largest convention which that association has ever held. This is assured, not only because the meeting is in Boston, with the many points of interest in and about it, but also on account of the prompt and businesslike management of President Eliot, who is supported by influential local committees. All the sessions of the seventeen departments will be held in the halls and churches in the immediate vicinity of Copley Square. General sessions will be held in the large auditorium of the Massachusetts Charitable Mechanics Association. In the exhibition hall of the same building there will also be an extensive exhibit of the Manual Training and Indian Departments. All department meetings will occur in the mornings, the general sessions in the evenings, thus bringing the department sessions into unusual prominence. It was with the purpose of giving a new importance to these department meetings that President Eliot held a conference of all the department presidents in Cambridge during the first week of January. As a result of this conference very complete programs have been prepared, each department being allowed one separate session and two joint sessions. With this increased number of meetings and the unusual number of speakers allowed, the department sessions promise to be unusually strong. The afternoons will be left entirely free for excursions and other forms of recreation.

Following are the programs of the manual-training department:

MEETING OF THE DEPARTMENT OF MANUAL TRAINING.

General topic: "Trade Schools."

1. "The Demand for Trade Schools."
   a) "From the Manufacturer's Point of View." Milton P. Higgins, president, Norton Emery Wheel Co., Worcester, Mass.
   b) "From the Educator's Point of View."
   c) Discussion.

2. "The Organization of Trade Schools."
   a) "From the Point of View of the School Superintendent." Dr. Thomas M. Balliet, superintendent of schools, Springfield, Mass.
   b) "From the Point of View of the Director of a Trade School." Arthur L. Williston, director of the department of science and technology, Pratt Institute, Brooklyn, N. Y.
   c) Discussion and suggestions from experience. Charles A. Bennett, director of department of manual arts, Bradley Polytechnic Institute, Peoria, Ill.
3. "Trade Schools and Workingmen's Organizations."
   a) "The Proper Attitude of Workingmen's Organizations." William H. Sayward, secretary of the National Association of Builders, Boston, Mass.
   b) Discussion.

JOINT MEETINGS OF THE DEPARTMENTS OF ART, MANUAL TRAINING, AND ELEMENTARY EDUCATION.

General topic: "The Relation of Art Teaching to Manual Training and Industrial Education."

1. "Craftsmanship in Education." Leslie W. Miller, principal of the School of Industrial Art of the Pennsylvania Museum, Philadelphia, Pa.
2. Discussion. Laurin H. Martin, instructor in applied design, Massachusetts Normal Art School, Boston, Mass.; Robert D. Andrews, architect, Boston, Mass.; Professor Albert Kingsbury, Worcester Polytechnic Institute, Worcester, Mass.
3. "Art Instruction as Related to Manual Work." Henry Turner Bailey, agent of the Massachusetts state board of education.
4. Discussion.
   a) "With Relation to Elementary Schools." Nathaniel Berry, supervisor of drawing, Newton, Mass.
   b) "With Relation to the High School." Fred H. Daniels, supervisor of drawing, Springfield, Mass.
   c) "The Point of View of the Manual-Training Teacher," Luther W. Turner, Hill School, Pottstown, Pa.

JOINT SESSION OF THE DEPARTMENT OF MANUAL TRAINING WITH THE DEPARTMENT OF ELEMENTARY EDUCATION AND THE DEPARTMENT OF INDIAN EDUCATION.

General topic: "Practical Suggestions on a Wide Application of the Manual-Training Principle."

1. "Some Reasons Why Elementary Schools Should Include Manual Training in Their Courses of Study." Elizabeth Euphrosyne Langley, School of Education, Chicago, Ill.
2. "The Boy and His Handicraft." George H. Bryant, Newport, R. I., president, Eastern Manual Training Association.
3. Discussion. Frank M. Leavitt, supervisor of manual training, Boston, Mass.; C. G. Pearse, superintendent of schools, Omaha, Neb.
4. "Handwork for High-School Girls." Miss Abby L. Marlatt, Manual Training High School, Providence, R. I., chairman, Lake Placid Conference on Home Economics.
5. "The Practical Value of Manual Training." James P. Haney M.D., director of manual training, New York city.

6. Discussion. Miss Lillie Collamore Smith, high school, Brookline, Mass.; Dr. Charles M. Jordan, superintendent of schools, Minneapolis, Minn.

THE next meeting of the Eastern Manual Training Association will be held in Boston, July 6 and 7. The National Educational Association will hold its sessions during the same days, but the meeting hours will not conflict. At this date the president, Mr. George H. Bryant, of Newport, R. I., is unable to give details concerning the program, but a list of able speakers will be secured. It has been decided that the exhibit this year shall consist entirely of photographs. These are to illustrate classes at work and shop equipments, as well as work that has been done by pupils.

THE papers and discussions upon manual training that have been presented before the National Educational Association are to be brought together in book form. During the past two decades nearly one hundred such papers and addresses have been given. With the elimination of such matter as has little value in our present-day methods, and a working over and classifying of material and subjects, such a book should prove exceedingly valuable. It is to be published by The Macmillan Co., and compiled and edited by Professor Arthur H. Chamberlain.

THREE courses in manual training are announced to be given in the summer school this year at Teachers College, Columbia University, New York city. Miss Lucy H. Weiser will give a course in manual training for lower grades, and Mr. Oswald R. Eklöf will give two courses in woodworking — one for elementary schools and another for secondary schools. These will begin July 18 and continue until August 19.

AGAIN the department of manual training at the Martha's Vineyard Summer Institute will be under the direction of Mr. Luther W. Turner. Work will begin July 14 and will continue for four weeks. Three courses will be given: (1) woodworking, (2) basketry, (3) "a course of scientific work"—the making of kites, water-wheels, windmills, derricks, etc., emphasizing "the thought side of manual training." Beginning just after the meeting of the National Educational Association, Mr. Turner's course ought to supply the needs of many teachers from the West and South.

THE Teacher's Training College of the German Association for Manual Instruction offers its customary attractive program for the summer term of 1903. Eight different courses are announced, including woodworking, cardboard, metal-work, modeling, and glass-work. The address of the director is Dr. Alwin Pabst, 19 Scharnhorst-Strasse, Leipzig, Germany. Circulars can be obtained in this country by writing to Mr. Fred R. Inman, Manual Training High School, Providence, R. I., or to the editor of the MANUAL TRAINING MAGAZINE.

ARTHUR D. DEAN, of the Mechanic Arts High School, Springfield, Mass., has returned from Porto Rico, and has decided not to accept the supervisorship of industrial education in that colony. He found Porto Rico a very interesting field, but could not bring himself to the point of making so radical a change as taking up this new line of work would involve.

MR. THOMAS W. MATHER, principal of the Boardman Manual Training School at New Haven, Conn., has resigned on account of ill health. Mr. Mather was formerly a professor in Sheffield Scientific School, and brought to the Boardman school a ripe scholarship, especially in mathematics and mechanical engineering. Mr. Charles L. Kirschner, of the drawing department, has succeeded him.

THE citizens of St. Joseph, Mo., have been asked to vote an issue of bonds to build and equip a manual-training school. In order to help crystallize public sentiment, a massmeeting was held February 23, at which Dr. Woodward, of St. Louis, gave one of his forceful addresses.

NEW YORK CITY.

THE March conference of the workshop instructors of the public schools of Manhattan and the Bronx was held at P. S. No. 27, One hundred and forty-seventh street and St. Ann's avenue on March 2, Dr. James P. Haney, director, presiding.

Mr. Thomas J. Meighan, principal of the school, extended a welcome to the corps, expressing his belief in manual training as a part of the school curriculum.

Mr. George I. Stahl spoke of the "Shop Loan Library," giving a list of some thirty books recommended as a workshop library for the use of the pupils. These consisted chiefly of books for boys on electricity, woodwork, drawing, etc. Such a library would furnish practical hints on the construction of household articles, experimental apparatus, and various other things which boys like to make, and would tend to stimulate interest in the useful and decorative arts.

A plan for the study of woods in the workshop was then outlined by Mr. R. V. Wolfe. He recommended the use of a bundle of straws to illustrate the texture of wood, and the cause and nature of splitting. Sections of trees were exhibited, showing the annual rings, the heart and sap wood, and the bark. Other specimens showed methods of cutting logs, shrinking, checking, and warping, fast and loose knots, etc. The speaker recommended presenting the main features of growth and structure first, then defects, such as shrinking and warping, and later sawing and finishing, reviewing in each grade much of the material given in the preceding grades.

The attention of the instructors present was called by the director to the plan of collecting clippings relating to handwork from magazines and papers, and mounting them for reference. Much emphasis was also laid upon the necessity of carrying the constructive work of the school over into the home.—W. F. VROOM.

AN examination for license as teacher of shopwork was recently conducted in the hall of the board of education. The salary now paid to such teachers ranges from $900 for the first year, increasing by $105 annually, until a maximum of $2,160 is reached.

NEW YORK STATE.

MR. CHARLES B. HOWE, recently supervisor of manual training at Hartford, Conn., who is spending this year in study at Cornell University, has been appointed instructor in machine design at Cornell. Half of each day he spends in study and the other half in teaching.

A NOTABLE exhibition of art and craftsmanship was held in Syracuse, N. Y., from March 23 to April 4, under the auspices of the United Crafts. The exhibition included examples of decorative glass, pottery, bookbinding and printing, metalwork, cabinetmaking, textiles, ecclesiastical and other embroideries, leather work and basketry; the specimens representing the best efforts of the most distinguished craftsmen of the United States.

All articles admitted to the exhibition were selected by a jury composed of the following persons: Mr. Henry Turner Bailey, director of industrial art in the public schools of Massachusetts; Mr. Frederick S. Lamb, secretary of the National Arts Club, of New York; Mr. Theodore H. Pond, of the Mechanics' Institute, Rochester;

Rev. Ezekiel Mundy, of the Public Library, Syracuse; and Miss Irene Sargent, of *The Craftsman*.

Adjunct to this display of contemporary American craftsmanship, there was an educational exhibit showing the results in manual training and industrial art from public and technical schools; also a fine collection of objects in metalwork (including lamps, candelabra, and scones), furniture, leather work, and pottery, recently selected by Mr. Stickley from the most artistic workshops in France and England, notably the Maison Bing, Paris, and the Birmingham Society of Handicraft.

SPRINGFIELD, MASS.

A PRACTICAL demonstration of the place which a manual-training high school fills in a public-school system is always interesting. So many of the members of the senior class of the Mechanic Arts High School were employed last summer in various business concerns that it was thought worth while to gather definite evidence of the effectiveness of such instruction. In a class of eighteen all were employed, and all but one received pay for his work. Six boys were employed by civil engineers in field work and in the drafting-room. Three were employed in electrical construction; one in joinery; one in machine-tool work; and the rest were engaged in some form of clerical work. The average wages were $8.50 per week. Two boys earned $12 per week. This activity is not confined to vacations, for two-thirds of the class now work outside of school and on Saturdays for pay.

EDWARD R. MARKHAM, who has been machine-shop instructor at the Mechanic Arts High School for the past two years, has resigned and accepted a position as mechanical engineer of the J. H. Williams Drop Forging Co., of Brooklyn, N. Y. Mr. Markham came to the school with a thorough knowledge of his trade, and his experience counted much in building up the department. He is considered an authority in all matters pertaining to steel, and is a frequent contributor to various mechanical papers, besides being the author of *The American Steel Worker*. Mr. Markham's place has been taken by Edward E. Holton, who was master mechanic at the Smith & Wesson Revolver Works. Mr. Holton is well fitted as an instructor in iron work, not only because of a broad experience obtained in mastering the various mechanical details which arise in large shops, but also on account of previous experience in teaching.

THE tenth semi-annual meeting of the New England Association of Teachers of Metal Work will be held in Springfield, Mass., on Friday and Saturday, April 10 and 11. The program will include visits to the United States Armory and Knox Automobile Works, of Springfield, and the J. Stevens Arms and Tool Co., of Chicopee Falls.

The evening session of the meeting on Friday will be devoted to a discussion of the place and function of ornamental iron work in a high-school course in forging. On Saturday there will be a discussion of the scope, influence, and future of the manual-training high school. Mr. Mathewson, of the drawing department, and Mr. Adams, of the forging department, have succeeded most admirably in connecting the work of these two departments. It is no easy task to have pupils make designs in ornamental iron work that shall be the product of individual work on the part of the pupils, and at the same time sufficiently practical and simple to permit working out without taking an excessive share of the limited amount of time devoted to forging

and without requiring any special equipment in the way of tools. The first problem was to design a candlestick. This was followed in the next class by hinges, escutcheons, and door knockers. The third class took up the problem of a bracket for a sign or lantern; and a class is now engaged in working out a practical lantern. The success of the work is due in a large measure to the fact that the pupils are held rigidly to simplicity of design, thus overcoming a great objection to work of this nature — the length of time required. Mr. Adams feels that the enthusiasm and interest of the boys in this work is a strong argument for introducing ornamental iron work into the course in forging, if it can be done without sacrificing any of the teaching of the fundamental and essential operations of forging. — A. D. DEAN.

PENNSYLVANIA.

FROM Mr. Paul Kreuzpointner, of Altoona, the veteran advocate of manual training, we learn that on February 19 the board of education in his city unanimously voted to establish manual-training schools and kindergartens. Mr. C. B. Connelly, of Allegheny, has been asked to give advice concerning organization and equipment.

ST. LOUIS.

MR. G. W. KRALL has been made principal of the St. Louis Manual Training School (connected with Washington University). Dr. Woodward still retains the directorship, having charge of appointments, course of study, and financial matters, but has given up the active management of the daily routine. The school is full to overflowing, and Dr. Woodward has given public notice that no more students need apply for admission during the present year.

TEXAS.

THE following is quoted from a letter from N. S. Hunsdon, director of manual training in the public schools of Austin: "We begin in the seventh grade now and go through the high school. Our enrolment last year was 80, while this year we have 187. It is only a question of time until our state will do something for every child in the public schools. It is hoped that the next legislature will pass a bill providing for the introduction of manual training into our public schools."

IN our last issue we stated that Supervisor C. T. Work had left San Francisco and gone to Austin, Tex., to take charge of a state industrial school. We were misinformed with reference to the place. Mr. Work went to Denton, Tex., to become the president of the Girls' Industrial College, a new state institution. The cornerstone of the massive building which is to be the home of this new school was laid January 10, at which time President Work gave the chief address.

The school has been established for the higher education of white girls in the arts and sciences, including literary courses, kindergarten instruction, telegraphy, stenography, photography, drawing, painting, designing, and engraving in their industrial application, general needlework, including dressmaking, bookkeeping, the chemical study of food, scientific and practical cooking, practical housekeeping, nursing and care of the sick, the care and culture of children, and such other subjects as may be deemed necessary from time to time in preparing girls for practical life.

The students will be apportioned by counties, and admission determined by a system of competitive examinations or by appointment of county authorities. The college will be open in September, 1903.

CALIFORNIA.

SLOWLY but surely the field of manual training is growing in California. In Los Angeles bonds have been voted recently for a manual-training high school. Los Angeles is certainly to be congratulated on having secured this appropriate finishing to a most thorough course of manual training in the grades, extending from the first through to the eighth.

A new movement has lately been started in California by a recent bill which gives state aid to high schools and technical schools. The first material proof of the good faith of the bill is the new California Polytechnic School at San Luis Obispo.

The success of this school will be watched with great interest here, and it carries the best wishes of all "manual trainers."

This school is being established as a state institution under an act of the legislature passed in March, 1901, and for which purpose the sum of $50,000 was appropriated. The act declares that "the purpose of the school is to furnish to young people of both sexes mental and manual training in the arts and sciences, including agriculture, mechanics, engineering, business methods, domestic economy, and such other branches as will fit the students for the non-professional walks of life."

Two buildings are now under course of construction, one for administration and recitation purposes, and one for a dormitory. The present legislature is being asked to appropriate $100,000 for the use of the school.

The school expects to open in September, 1903. Its course of study will be of similar grade to a high school. Students will be admitted without examination upon presentation of a grammar-school (eighth-grade) certificate. Those who do not hold such a certificate will be admitted at the age of sixteen or over, upon passing a satisfactory examination in English and arithmetic.

The course of study will include agriculture in all its branches—horticulture, animal and dairy industry, irrigation, forestry, gardening, farm management, etc. A farm of 280 acres has been purchased for the site of the school. It contains a variety of soil, from low bottoms to rough hills, and will give large opportunity for demonstration in various cultures.

It is expected that the school will eventually be equipped to give instruction in the different lines of mechanics and engineering, such as are usually found in schools of similar grade. The school will open with instruction in carpentry and forge work. The work of the bench will be supplemented by the students constructing the frame buildings which are needed by the school and farm.

A course in domestic economy is being arranged with special reference to the needs of girls who wish to become housekeepers. Their training will include the usual studies in cooking and serving meals, sewing, dressmaking, house management, sanitation, and in fact everything which goes to make up the house useful and the home beautiful.

The academic instruction will consist of English, history, economics, bookkeeping, botany, entomology, chemistry, physics, physical geography, freehand and mechanical drawing, and land-surveying. The aim is to give instruction in such studies as the boy and girl will most need to make them better citizens and to give them a firm grasp upon the natural phenomena with which they are continually meeting.

The guiding principle of the institution is eminently industrial. The student will be taught how to do by doing. The industrial work as well as the entire course

of study is planned more particularly for the needs of the country rather than city communities. For a time at least the chief course of study will be agricultural in its bearings, and all mechanical work will be given as supplemental to the education of the boy who is going back to the farm. A wide field is open in California for a school of this character, and not only in California, but also in every state in the Union.—CHARLES H. THORPE.

CHICAGO.

DR. GABRIEL BAMBERGER died in Chicago on January 9. For the past twelve years he has been the superintendent of the Jewish Manual Training School on the West Side, and has been widely known as an advocate and organizer of manual training. Mr. Bamberger was born in Germany fifty-seven years ago. He came to this country about 1878, and before coming to Chicago was superintendent of the Workingman's School of the Ethical Culture Society in New York city.

JUNE 29 and 30 are the dates set for the examinations of candidates for positions as teachers of manual training, household arts, and drawing in the Chicago public schools.

THE summer term of the Chicago Normal School will begin June 29 and continue for four weeks. Manual training is one of the subjects in which instruction will be given.

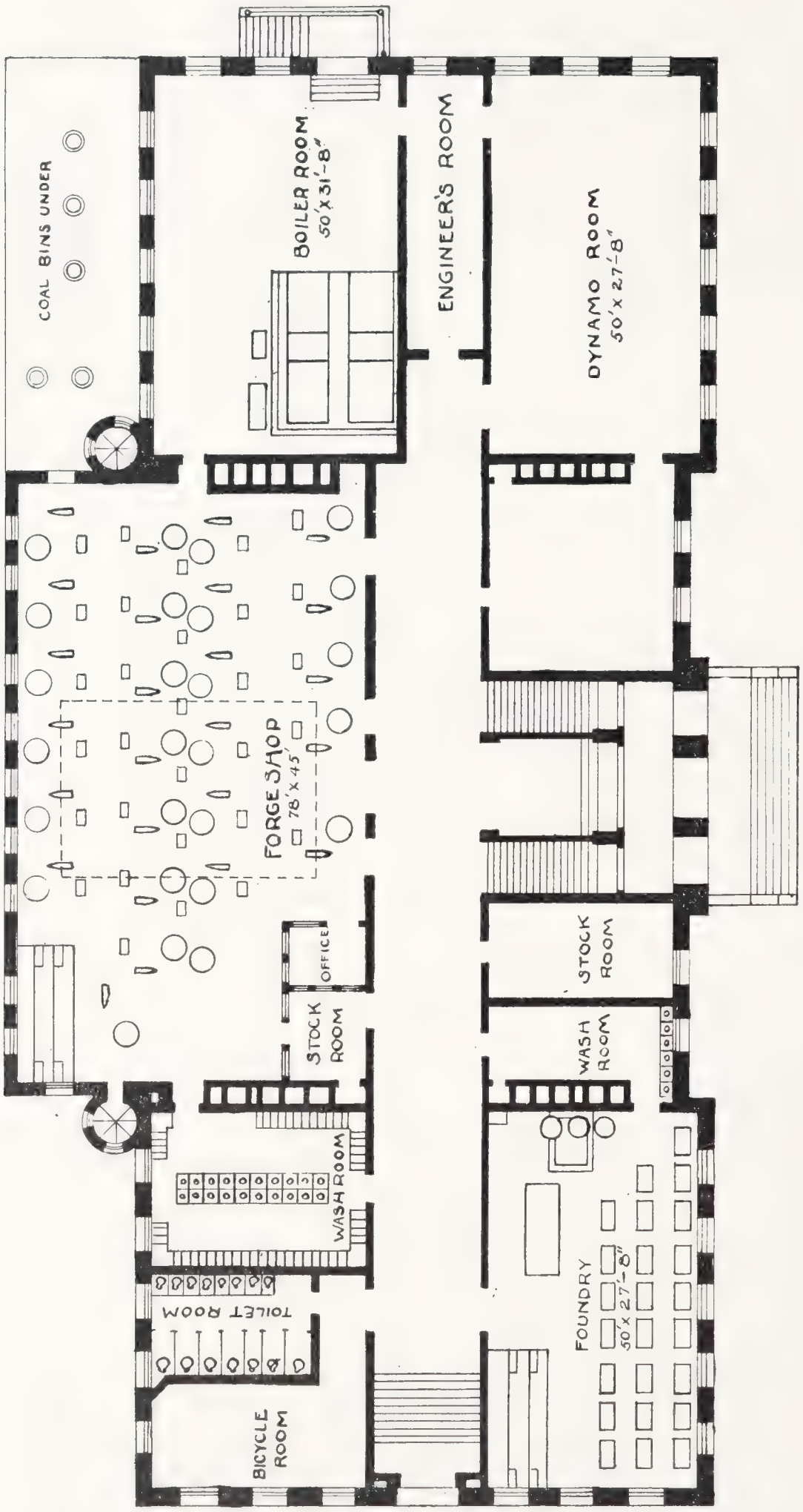
THE Merchants' Club has offered a prize of $150 for the best plan of a school kitchen adapted to public schools' use in Chicago.

MR. FOSTER H. IRONS, teacher of manual training and mathematics in the Laboratory School of Education, University of Chicago, is announced as an instructor in the summer school at the University of Illinois, Champaign. His course will be in manual training, and will cover a wide range of work suited to the needs of teachers in elementary and secondary schools. Talks and conferences on educational values, methods of teaching and the correlation of manual training with other school subjects will constitute an important part of the course. Mr. Albert R. Curtiss, of the University, also will teach a course in woodworking. These courses will begin June 15.

BROOKLINE'S NEW MANUAL TRAINING BUILDING.

DESIGNED to be the middle and largest of three public structures, the new building for the manual-training department of the Brookline (Mass.) High School has a prominent setting, with the public baths on the right and the gymnasium (not yet erected) on the left. As the sun lights up the mottled green slate roof, the soft red bricks and the light gray sandstone, the first glance suggests the hope that here is a manual-training building which combines beauty and utility. This hope is fully realized when one enters and finds that all the walls are painted in well-chosen colors, the ceilings tinted, and the windows of the staircase colored. Having red slate treads, green tile risers, and arched construction beneath, the staircase as well as the two circular fire escapes are entirely of masonry.

The principal rooms are located as follows: In the basement—which is as light as the floors above, since it is not lower than four feet below ground—are the forge-room and the foundry, the engine and boiler-rooms; on the first floor, the joinery, the wood-turning and pattern-making rooms and the machine-room; on the second floor, two drafting-rooms, the library, the sewing-room, and two for domestic science, not



BROOKLINE MANUAL TRAINING SCHOOL, BASEMENT PLAN.

yet occupied. After brief descriptions of some of these rooms, special features of design and equipment will be mentioned.

Located in the back and center of the basement, and extending seventeen feet wider than the rest of the building, is an unusually spacious forge-room lighted by windows and a great skylight. The down-draft forges are from Sturtevant. Near the instructor's forge is a power drop-hammer. At a bench at one end of the room are four mechanic's vises. The floor is of red brick, and the walls are gray and olive.

These tones prevail also in the boiler-room adjoining on the right, where there are two ninety-horsepower boilers which furnish heat and power. They are of the horizontal type, and are so constructed as to operate both by the gravity and the high-pressure systems. A seventy-five-horsepower Westinghouse standard engine, directly connected with their fifty-kilowatt generator, and a fine switchboard occupy another room.

The foundry occupies the left front corner of the basement, and contains the equipment previously used, with the addition of a new furnace, crucible, and oven.

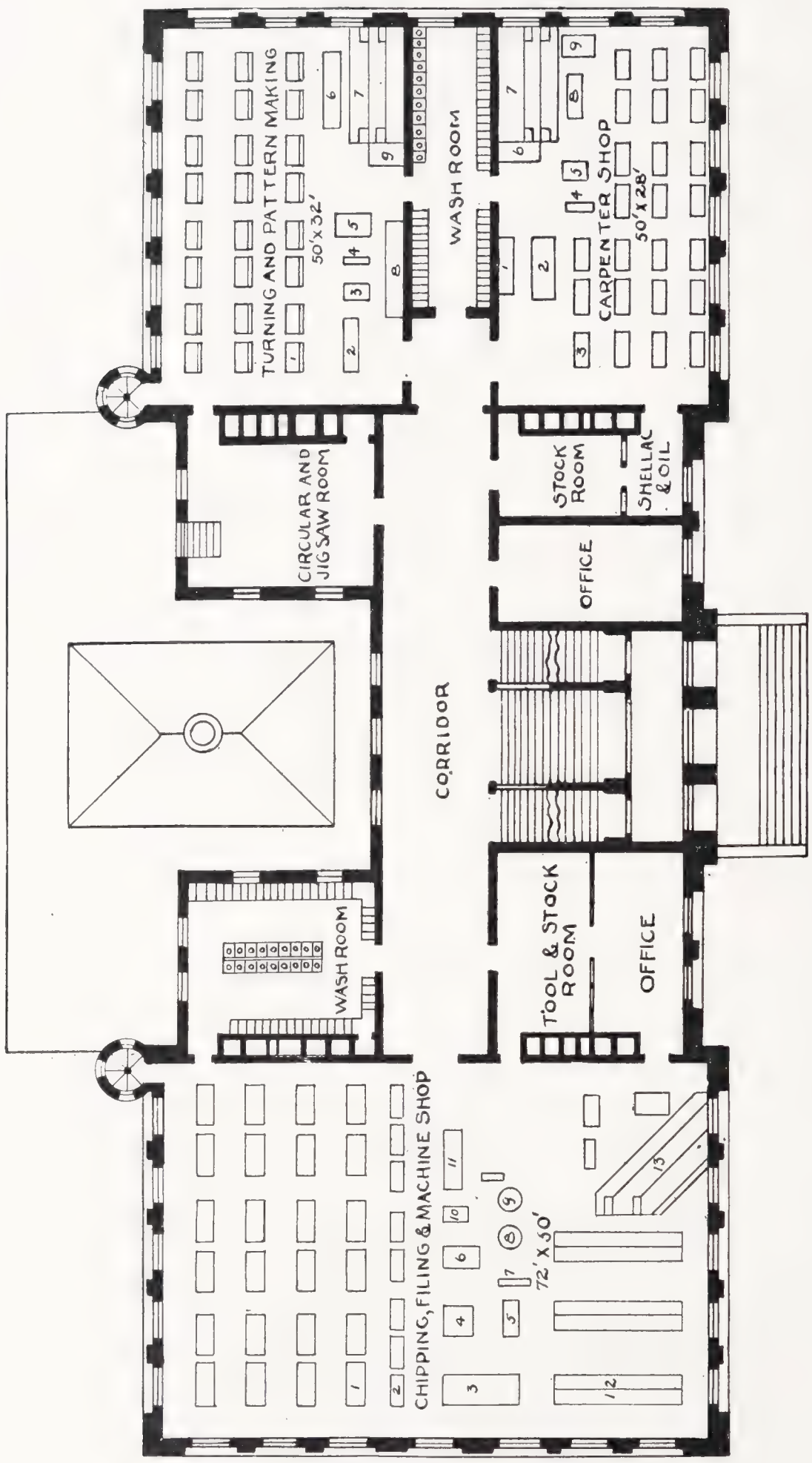
On the first floor the joinery-room occupies the right front corner, the wood-turning and pattern-making room the right back corner, and the machine-room the whole left end of the building. In the joinery-room, near the instructor's bench, are a grindstone, an emery stone, and a jig-saw. The bench will receive special mention later.

The unit of equipment in the wood-turning and pattern-making room is similar to that of the Mechanic Arts High School and the Institute of Technology in Boston. It may be described as a joinery bench with a lathe-bed set upon the back edge, which is lowered six or seven inches to form a ledge. A set of drawers for each kind of work is placed respectively below the lathe-bed and the bench proper. It is compact, but it necessitates the worker's passing around the end of the bench and lathe to reach the other part of his equipment; hence the light cannot be equally good for both lathe and bench work. The glue pots are set in a copper tank of water heated on a gas stove-plate. A band-saw, a jig-saw, a wet-emery stone, and a large Putnam lathe with a gap in the bed which will swing thirty-six-inch work, comprise the special equipment. To the ceiling are fastened one small motor for the instructor's lathe and one large one for the other machinery. The tone of the room is brown. In the stockroom adjoining are a buzz planer and a universal saw-bench.

In the machine-room the benches for chipping and filing occupy the left front corner of the building; these benches and their equipment are of the usual type. The machinery of the room is for the most part new and comprises fourteen Reed lathes, four special lathes, two drills, a shaper, planer, milling machine, drill grinder, wet-emery stone, horizontal centering machine, and a belt-lacing device. Seven or eight speed lathes will be added later. The tone of this room is green.

On the second floor the sewing-room occupies the left back corner of the building and the two drafting-rooms the two right corners. Besides the oak sewing-tables, which are conveniently high at twenty-six inches, the sewing-room contains three large cutting-tables, two sewing machines, several forms, and a large cabinet for work and display. Neither in this room nor in the drafting-rooms are there demonstration theaters.

In the drafting-rooms the fixed double tables previously used are retained. These contain individual drawers and drawing-boards and two sets of instruments. Because of the increased number of classes in drawing, some boards are kept in racks



BROOKLINE MANUAL TRAINING SCHOOL, FIRST FLOOR PLAN.

at one side of the room. The tone of these rooms is blue. A darkroom and a blue-printing room are near at hand.

In designing this fine building Mr. Joseph Untersee, the architect, and Mr. Edward Hutchinson, the director of this department of the high school, have worked intimately. To the credit of the former is due the thorough and artistic construction of the building, and to the latter all the many convenient details which an experienced teacher finds so conducive to efficient and orderly work. The equipment throughout is designed for twenty-four in a class, except in the machine-room where there are eighteen lathes available. Pigeon-holes for pupils' work are arranged in horizontal rows of twenty-four each, and are locked by two panels. In the upper part of the cabinets containing these pigeon-holes are several large compartments for special work; in the lower part, large drawers. The Wheaton countershaft, which is so compact and efficient, is provided for all machines needing it. In the wash- and locker-rooms one is pleased with the enamel basins, open plumbing and nickel trimmings. Floors are of maple and finish of ash. All the demonstration theaters have eighteen-inch risers with an intermediate step and three rows of writing chairs. Into the design of the joinery bench has gone much thought. It is unique in having a locked compartment for the general tools which projects several inches above the top of the bench and occupies the middle and right corner of the farther side. The front of this compartment drops into the bench when unlocked, and the top swings up and back. The whole can be lifted out of the bench, if desired. At the extreme forward end of the front of the bench is a Wyman & Gordon vise of special design in that it carries a square wooden peg near the right end of the jaw. Through the top of the bench is a row of holes with a peg to accommodate a wide range of work. The peg is the only bench stop. Under the bench to the right are five drawers containing individual sets of edge tools; to the left, an open compartment.

The history of the manual-training movement in Brookline, of which this new building is the latest and best offspring, reaches back at least to 1868, when a small body of women secured an opening for the teaching of sewing in the public schools. In 1885, again under the lead of interested women, cooking was added. Instruction in woodworking was the outgrowth of a four-years' success in an industrial vacation school first opened in an engine-house in July, 1884. The influence of the late Dr. John D. Runkle, sometime member of the school committee, is evident in the character of the early courses given. In January, 1890, an annex to the Lincoln School, suitable for several forms of shopwork, was opened. It was intended that this annex should become a manual-training high school, but the growth and interest of the grammar grades has prevented this result, although high-school boys have received their instruction in manual training here. In 1899, after a year or two of agitation, the town appropriated funds for the present beautiful structure.

A word should be added concerning one special way in which this building and its equipment will be used, namely, in more closely correlating science and manual training. In the science lecture-room lantern slides will be shown giving views and sections of all the principal machines and appliances in the building, and the theoretical aspect of each will be explained. The laws of physics will be studied in concrete form. In the manual-training rooms pupils will make typical and special pieces of apparatus and appliances for their own use.

HARRIS W. MOORE.

WATERTOWN, MASS.

REVIEWS.

Bibliography of the Manual Arts. By Arthur Henry Chamberlain. Published by A. Flanagan Co., Chicago, 1902. 5 × 7¼ in.; pp. 100; price, $0.75.—Every student of manual training will find this little book a most valuable addition to his library. It is the most complete of any published bibliography of manual training, besides having other valuable features. Its classification of titles is good; first comes "History and Philosophy," then papers read at association meetings and magazine articles. Under "Methods and Practice" are separate sections for each of the following: modeling, basketry, paper and cardboard, woodwork, bent iron, wood-carving, pyrography, turning and pattern-making, metal and machine work, miscellaneous. This is very convenient. Home science, including sewing, food and cooking, laundry work, textiles, and miscellaneous, is given a separate section. The titles in foreign languages cover eighteen pages and are arranged by countries. But the feature of the book that gives it peculiar practical value is the plan of placing brief comments after many of the more important titles. These enable one to determine whether or not he wishes to use the book or article.

Barring individual opinions, which would be sure to differ in some respects, these comments are such as may be depended upon. They are not based upon hearsay, but upon contact with the publications themselves.

Teachers of manual training ought to be very grateful to Mr. Chamberlain for performing such a service, covering as it did five years of time in preparation. —C. A. B.

The Educational Foundations of Trade and Industry. By Fabian Ware. No. 54 in the "International Education" series, edited by Dr. William T. Harris. D. Appleton & Co. 5×7 in.; pp. 300; price, $1.20, *net.* This book was written for the purpose of "placing before the English public an accurate account of the educational foundations of foreign trade and industry," but the information it contains can hardly be of greater value in England than it is in America at the present time. It discusses just the problems that are now before us in each section of our educational system — elementary, secondary, and higher — whenever we consider education with reference either to vocation or national prosperity.

The book begins with a chapter on the growth of national systems of education. This is followed by two chapters on efforts in England to lay educational foundations. Then come three chapters devoted respectively to the German, French, and American systems of education. These expositions are not mere inventories of national differences, but, as Dr. Harris says in the editor's preface, "they afford enlightenment to the seeker after wisdom."

The theme of the book may be expressed in the words of the author when he says: "The qualities which make the good citizen are precisely those which also make the successful tradesman or manufacturer." The corollary to this is: "It would therefore appear that, in this connection, nothing is gained by regarding the practical demands of industry and commerce apart from their national welfare; and

that, not only in the section of education which is concerned with general development, but in those other branches which are devoted to special training, the general educational aim must not be ignored." This has come to be an unwritten law in American education, but even laws are sometimes stretched to the breaking-point. We need, therefore, to know why such a law should prevail. Such a philosophic comparative study of systems as Mr. Ware has given us surely will help toward that end.

The author concludes that Germany has the best-organized system of education, though it is apparent that he looks with particular favor upon many features of our American democratic system. He emphasizes three points in which our system differs from the German: "First, in its large provision of free secondary and university education; secondly, in its recognition of the equal rights of both sexes to the same educational opportunities; and, thirdly, in the close connection existing between the universities and technical schools." He also approves of our manual-training schools.

This book may be heartily commended in the interests of a broader and more intelligent outlook.—C. A. B.

Practical Cooking and Serving. By Janet McKenzie Hill. Published by Doubleday, Page & Co., New York. 5¼ × 8 in.; pp. 731; 200 illustrations; price, $2.00 *net.* Although somewhat hackneyed, the title introducing this new book, by the editor of the *Boston Cooking School Magazine*, is well chosen. The compilation has been made for the intelligent housewife rather than for the teacher of cooking. Of the 750 pages of text nearly three-fourths are devoted to cooking recipes in large variety, accurate, clearly explained, classified, indexed, and free from needless repetition. The remaining chapters contain helpful information, condensed and simply stated, regarding the selection, combination, and serving of food. Two hundred illustrations from photographs occupy 72 additional pages. Many of these have appeared from time to time in Mrs. Hill's *Magazine* and the *Ladies Home Journal.* If at first glance they seem to represent an excess of garnishing and useless decoration rather than well-prepared food, they still contain excellent suggestions as to tools and utensils, methods of work, and manner of serving. Since our culinary nomenclature is largely foreign or provincial, few names of dishes are self-explanatory, and the editor's apparent effort to choose the simplest and most expressive is commendable.

The chapters on food principles, diet, digestion, etc., are of value in connection with the analyses of food materials preceding the several chapters of recipes. These should enable the housewife who has had an introduction to food chemistry to build up her dietary with little study.

While well printed and arranged, the volume is too large for convenient handling. It emphasizes the fact that we have outgrown the old catch-all "cookbook" and should no longer expect to find information worthy of a half-dozen handbooks crowded into one.

GERTRUDE CONBURN.

BRADLEY POLYTECHNIC INSTITUTE.

Linear Drawing and Lettering for Beginners. By J. C. L. Fish, associate professor of civil engineering in the Leland Stanford Junior University. Published

by the author, Palo Alto, Calif. 7×10½ in.; pp. v+65; 46 figures, on plates folding out. Price, limp cloth, $1, post-paid.—Prospective purchasers of this book should note well its title so as not to be misled. It is a work upon the drawing of lines, not upon mechanical drawing, though leading up to the latter and all other drawing done with the aid of instruments. Its object is, to quote from the preface, to "furnish the student enough training in the use of drafting implements to enable him to construct accurate pencil drawings, make clean-cut ink lines, and do legible lettering."

The first chapter is devoted to the consideration of instruments and materials, after which follow chapters on "A Course in Linear Drawing," "A Course in Lettering," and "Introduction to Drafting," in the order named.

Throughout, the directions given are very complete and right to the point, indicating the author's familiarity with the needs of students, and the errors beginners are liable to make. What is also of no slight importance in a book of this nature, where so much information regarding minute details is furnished, the arrangement and printing are such that reference to the text is easy, and therefore an aid to its comprehension.

But two styles of lettering are shown: the vertical and the inclined, both of the simplest form, and both to be made freehand. The author was wise not to give a variety of alphabets, for the learner is apt to flit from one style to another in hopes to find one he can master in a few trials, not realizing that the simplest alphabet cannot be made to look well without closest attention to details and much practice upon his own part.

The proper construction and shape of each letter and figure, the arrangement and spacing of titles, and the choice of pens for lettering are duly considered.

The book will not stand much rough handling, though it is bound well, considering its price.

JOHN H. MASON.

STOUT MANUAL TRAINING SCHOOL,
Menomonie, Wis.

Blank-Book for Lettering. With plate of alphabets, to be used with *Linear Drawing and Lettering.* By J. C. L. Fish. Published by the author, Palo Alto Calif. 7×10½ in.; 30 sheets ruled on one side; price, $0.25, post-paid.—This, as is' clearly indicated by its title, is a book for practice in the styles of lettering advocated by the author in his work, *Linear Drawing;* and the same sheet of alphabets shown in the latter is incorporated in the blank-book. This sheet folds out from the back cover, and in such a way as to be directly in front of the student as he makes his copy.

The practice pages are ruled in light green ink, quite similar to profile paper, and are adapted for use with both the vertical and inclined styles of letters.

JOHN H. MASON.

STOUT MANUAL TRAINING SCHOOL,
Menomonie, Wis.

Nature and the Camera: How to Photograph Live Birds and Their Nests; Animals Wild and Tame; Reptiles; Insects; Fish and Other Aquatic Forms; Flowers; Trees and Fungi. By A. Radclyffe Dugmore. Doubleday, Page & Co., New York: 6×8½ in.; pp. 126; price, $1.35 *net.*—The increasing use of the camera

by all true lovers of nature renders the publication of this book timely and valuable. The well-known author of *Bird-Homes* has given here such "suggestions as might be of help in the overcoming of the many and varied difficulties encountered by the nature photographer." The methods which he has employed in photographing birds and their nests, animals, reptiles, insects, fishes, and plants are clearly and briefly explained. For the beginner in the art of photographing, there are directions for the purchasing of the necessary photographic outfit, exposing, developing, printing, etc., and detailed instructions for photographing the various forms of nature. The general reader will find an interest in the many and beautiful reproductions of the author's own pictures from life with which the book is profusely illustrated.

W. H. Packard.

Bradley Polytechnic Institute.

The Story of the Art of Building. By P. L. Waterhouse. D. Appleton & Co., New York, 1901. 4 × 6 in.; pp. 213; price, $0.35, *net.* — One who is looking for a book on the history of architecture to place in the hands of students of high-school grade, as supplementary reading in connection with drawing or talks on the history of architecture and ornament, will find this little book well suited to his needs. Professor Hamlin's excellent book is a college text-book and not intended for the use of students below college grade, and the other books we have seen are either lacking in quality or quantity of material, or their style is not suited to young readers. This book deals with the salient points in the development of architecture "from the pyramids to St. Paul's," with an added chapter on architecture in America. It contains a wealth of information which is well arranged and presented in a clear and interesting form.— C. A. B.

How to Make Rugs.— By Candence Wheeler. Doubleday, Page & Co., New York, 1902. 5 × 7½ in.; pp. 130, illustrated; price, $1, *net.*—This book is intended as a help in adapting the methods of weaving used by our grandmothers to the demands of today, and "to open a new field to the farmer's family during the winter months." It presupposes that the technicalities of the process of weaving on a hand-loom are known to the reader, or that they can be learned from a neighbor or friend. This being so, the book is devoted to giving helpful practical suggestions, words of encouragement, and sound business advice. It tells what kinds of materials to use, where to get them, and how to work them into beautiful patterns. Several types of rugs are discussed at length; a few of them are illustrated. Dyeing is given considerable prominence, though no attempt is made to cover all the technicalities of the process. The whole book is permeated by the art-craft spirit, and is sure to be of great service in many communities. It is well written, and appropriately printed and bound.—C. A. B.

Year-Book; Council of Supervisors of the Manual Arts, 1902. James Parton Haney, secretary, 500 Park Avenue, New York, N. Y. 7 × 10 in.; pp. 165 + 11 for notes; price, $3.—This second year-book of the Council is in the same dignified style as its predecessor, but contains about twice as many pages. The first paper in the present volume is on "Color in the Elementary Grades," by Ernest Allan Batchelder; the second on "Ultimate Aims in Design," by William J. Edwards; the third on "Some High-School Courses in Drawing," by Carlton C. McCall. These are followed by

three papers which are bibliographical in character. The first, entitled "An Outline of the Study of the Manual Arts," is by Julia Cecelia Cremins; the second, on "The Year's Progress in the Manual Arts," by Louisa Pierce; and the third, "A Working Library for the Supervisor of the Manual Arts," by Elizabeth H. Perry. The volume also contains "Illustrative Drawing," by Frederick Whiting; "Pictorial Composition," by Henry Turner Bailey; "The Use of Pictures in Elementary Schools," by Lillian Dearborn; and "The Study of Pictures in High and Normal Schools," by Annette J. Warner. The last two papers in the volume are "Plant Drawing as a Mental Discipline," by Willis B. Anthony, and "The Relation of the Manual Arts to the Curriculum," by James Parton Haney.

With one or two exceptions, each of these papers represents a large amount of labor. Several of them are scholarly and full of suggestions, while others, Miss Perry's, for instance, are valuable for reference. If the Council's annual publications continue to improve in the same ratio as in the past, its year-book will soon be looked upon as gathering together the best thought and experience of the year for comparison, inspiration, and future reference. To this end it would be well for the Council to make its membership more broadly representative. We are glad to notice that steps in this direction are being taken.—C. A. B.

The Manual-Training Schedule. By James P. Haney, M.D., supervisor of manual training, New York city. Published by the Department of Education, New York, 1902. $7\frac{1}{2} \times 10\frac{1}{2}$ in.; pp. 45; paper cover.—This volume is a mine of valuable suggestions for supervisors and teachers of drawing and manual training. It contains perhaps 1,500 drawings illustrating every phase of the construction and design work being done in the public schools of New York city. The volume is produced by binding together the sheets of directions given to the teachers of the several grades. These sheets are not sent to the grade teachers in the spirit of dictation and command, but rather as helpful suggestions. The marked success of this plan in New York should commend it to others. It stimulates individual effort and originality on the part of teachers and pupils, as no rigid course of study possibly could do. A new color chart accompanies the schedule.—C. A. B.

Manual Training, and How to Introduce it into Public Schools. Advance pages of chap. ii of the biennial report of the superintendent of public instruction of the state of Iowa. By Richard C. Barrett, superintendent, assisted by A. C. Newell, supervisor of manual training at West Des Moines, Des Moines, 1903. 6×9 in.; pp. $28+4$ full-page illustrations; paper cover.—This report is planned to meet a definite need in Iowa at the present time. It is not written for the use of manual-training specialists, but to encourage the smaller cities and towns to introduce manual training and to give them needed data. It contains specific answers to questions that are being asked at the present time in nearly every town in the central states. Iowa's lead should be followed by other states. The pamphlet is not intended for general distribution outside of Iowa, but it is probable that a limited number can be so distributed. —C. A. B.

VOLUME IV NUMBER 4

MANUAL TRAINING MAGAZINE

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INDUSTRIAL WORK AT THE HYANNIS NORMAL SCHOOL.

W. A. BALDWIN,
Principal of State Normal School, Hyannis, Mass.

HAVING been requested to write for the MANUAL TRAINING MAGAZINE an article describing the industrial work which is growing up in the public schools of Hyannis, Mass., it seems best to take the reader on an imaginary visit to this place.

The village school consists of over two hundred children of the nine grades and is used as the training department of the Hyannis State Normal School. If your visit were to be made at three o'clock in the afternoon, you would see a school very much like the ordinary village school, housed in a modern brick building of six rooms and doing the usual schoolroom work. At five minutes after three you would see a transformation. The school becomes a manufactory in which each child is making something. In the first-year room one group of children, working in pairs, is engaged in weaving woolen rugs for the dolls' house; some are braiding, and others are sewing their braided raffia into mats. In the second-year room a group of the children are making furniture of tag-board, while the other division of the class has gone to work in the garden. In the third-year room the third-grade children are making raffia baskets, while the fourth-grade children are out working in their garden.

Of the children of the grammar grades, some boys have gone to the attic to make rattan baskets; one group of girls is at the dormitory sewing on the machine; the eighth-grade boys and girls are at work in their garden, and one class has taken an expedition into the fields to study the birds.

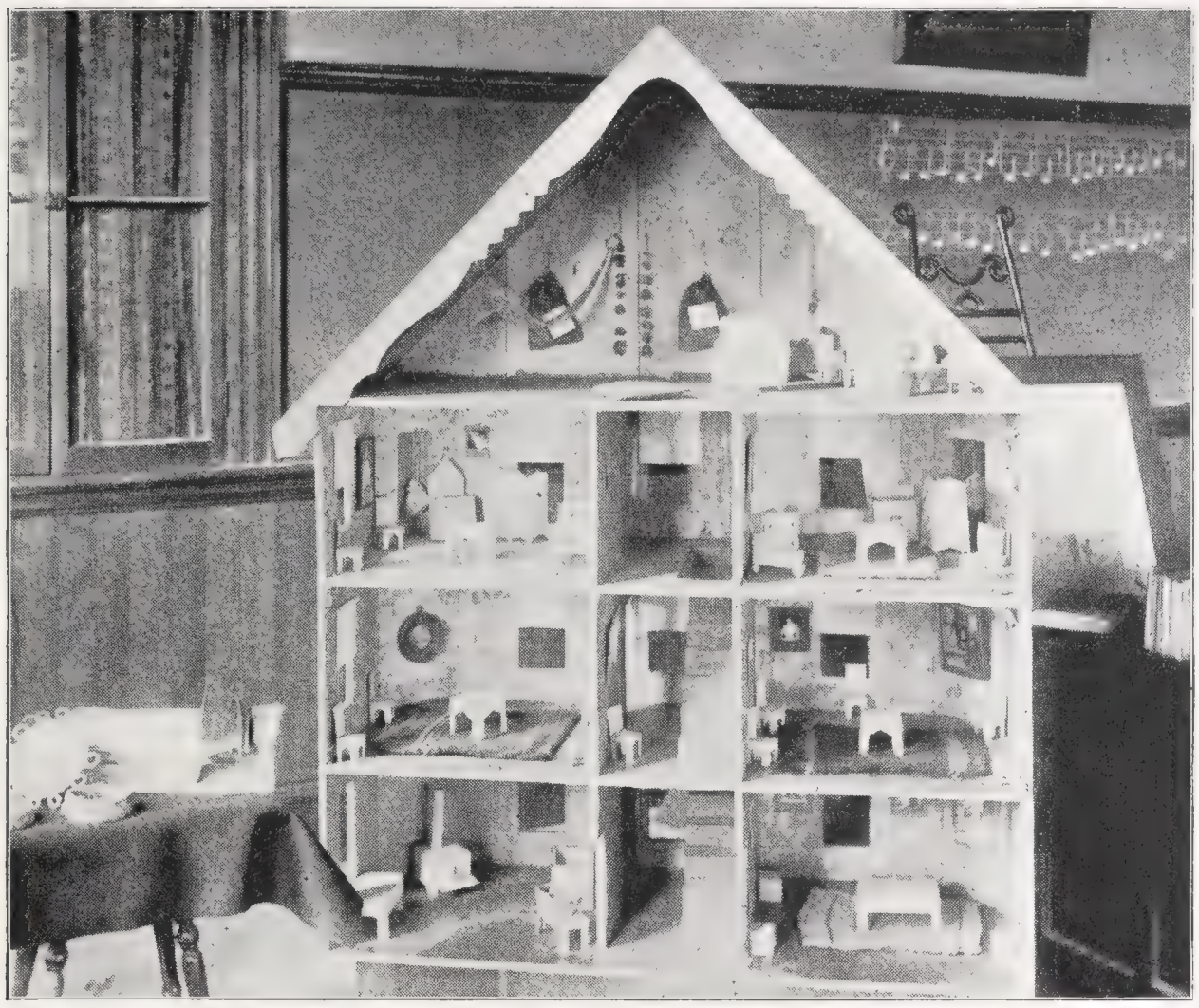
The children talk quietly together as they work. They go and help themselves to material as it is needed, and help each other when it seems desirable. (Often a child proves to be a more helpful

instructor than the teacher.) They are allowed the utmost liberty as long as they work and encourage others to work. It is worth going far to see the new spirit which shines in their faces and the new attitude which has been developed toward nearly all of the school work. This is evident throughout the day and in all grades.

Having had a glimpse of the school as it is now, the reader may like to know how this transformation came about. The Hyannis Normal School was organized in 1897. The training school came under the direct supervision of the normal school in 1898. We first attempted to put the work on a basis similar to that of the more progressive public schools of the state. Some kindergarten occupations were introduced in the primary grades. Considerable attention was given to physical training during school hours and at recess time. Children went out on expeditions for nature-study during school-hours, and some regulation manual-training work was introduced.

But gradually we became convinced that we were working only on the edge and very largely from without. We seemed to be changing the outer form without much change of the inner spirit. In the spring of 1901 we gave the children, who should have taken woodwork and sewing, garden work. A section of the campus, about one hundred and eighty by fifty feet, was fertilized, plowed, and harrowed, and the seed was purchased by the state. Then this land was turned over to the teachers and pupils. Meanwhile the members of the class had gained some valuable letter-writing experience in sending carefully written letters to seedmen. They had reviewed their knowledge of mensuration by measuring and measuring again the garden, and plotting off the same into different sections for the planting of the various kinds of seeds. Many discussions arose regarding the best time and place for the planting of the different kinds of seeds. These furnished splendid opportunities for connecting the home and the school, for the use of reference-books, and for good, live language work, both oral and written.

As soon as the weather was suitable, the children began to prepare the ground for planting, and on pleasant days they worked in the garden about an hour each afternoon. They became very observant of weather conditions. The different kinds of seeds were planted in their seasons, some, like lettuce and sweet corn, being planted at different times. Records were kept, in books provided for the purpose, of the time of planting, the time of coming up, and the various changes in the growing plants. Plants were compared as to their



PLAYHOUSE FURNISHED BY CHILDREN OF PRIMARY GRADES.

relative rate and manner of growth, and the ideas gained from these plants were used as a basis for reading of the growth of similar plants in other parts of the world. The first radishes were sold to the dormitory, and for these the class received its first check. This, with other checks and cash received from the sale of garden produce during the summer and fall, amounting to over thirty dollars, was deposited in the Hyannis National Bank. The whole class went to the bank and learned exactly how to make a deposit and to draw out money. Each pupil was provided with a blank book into which he copied bills of produce sold, deposits made, and checks drawn.

After the fall term began, the same class, now the eighth grade, again assumed the care of the garden. The children picked and sold tomatoes, sweet corn, squash, and cucumbers, pulled beets and turnips, and saved corn, beans, and other seeds for next year's planting. They also studied forms of fruit and seeds, and the relation of plants to some animal life, like the larvæ on the turnips and tomatoes, and the parasites on the tomato larvæ.

After finishing the garden work, the class elected a president and secretary, and discussed what it should do with the money. A committee was appointed to consider the matter and make recommendations. After several days of consideration the committee reported, advising the expenditure of not more than five dollars for a little class party to which each member might invite a friend, the purchase of some cord for hammocks, and the acceptance of my offer to teach them how to make hammocks which might be sold and the proceeds of which might be added to the bank deposits. The report was

SECOND-GRADE CHILDREN BRAIDING AND SEWING RAFFIA HATS.

accepted with enthusiasm. The pupils gained some good points in parliamentary practice in connection with class meetings. They learned how to write notes of invitation for their party and gained some valuable hints on entertaining. Before they could make their hammocks, each was obliged to whittle out his own block and needle. This required considerable care and perseverance, but the hammock-making lured them on and they persisted. Their interest has steadily increased as they have grown in the sense of their own power to do something that has a commercial value. This garden work, and that with which it had been correlated, had proved so interesting and so valuable that we seemed to have a good basis on which to build.

As the work of the autumn opened up, it seemed to me that the time was propitious for a forward step of considerable importance. Several of the regular weekly faculty meetings, in which the teachers of both the normal and training schools take an active part, were taken up with the reading and discussion of Dr. Hailmann's address before the graduates of the teachers' classes in manual training in the

Public School of Industrial Art, Philadelphia, June, 1894, as it appears in *New Methods in Education;* some portions of Professor Dewey's *The School and Society;* some passages from Pestalozzi's *Leonard and Gertrude* and from Froebel's *Education of Man;* and a paper which I had written on manual training. Then I said to the teachers something like this: "You are good, strong teachers, and the work is sure to go pretty well if I say nothing, but we have been working together now long enough to be acquainted, and I believe we have the confidence of the community, and I think we are ready to put things on a different basis, to change the whole attitude of our school. When you think of a school, of what do you think? Rows of desks with children in them, prisoners in their cells, not held by iron bars, but by the will of the teacher. When you think of the work, how much of it originates with the pupil? Go through the work of any regular school day, and figure out the per cent. of work which is imposed upon the children from without and the per cent. which grows out of the conscious personal needs of the child. Is the child's standpoint receiving its due attention?

FOURTH-GRADE SCHILDREN BRAIDING, WEAVING RUG AND MAKING BASKETS.

"As a teacher and as a superintendent of schools I have been much interested in the introduction of nature work of the right kind into the schools, and have seen the wonderful joy and inspiration which such work has brought into many schools where teachers and pupils have gone out together into the fields and have brought the spirit of the fields into the schoolroom.

"Very early, too, I began to appreciate the value of having children make their own apparatus in school. I saw in the kindergarten

and manual-training schools how the children loved to be doing things. Gradually, but surely, I have come to my present belief that much of the education in our schools is not practical, because it is unnatural and artificial. We take the young child away from the fields and woods, where he longs to be, and put him into a box, which some of us have been trying to adorn and make into a gilded cage. Even here we are unwilling that he shall move about and exercise his young and growing muscles, but he must be trained to sit quietly in one place and in one position for the best hours of the day.

"When you think of the child as you see him at home, in the field, or on the street, full of life, of activity, which is a part of his very life, and of joy, which is the natural accompaniment of the activities of the live American boy, and then think of him as you see him in the average school, you cannot but be impressed with the contrast. Out of school he was a veritable interrogation mark; in school the tables are turned and he must answer instead of ask questions. Out of school, from morning until night, he was the personification of perpetual motion. In school, if he obeys the rules of the school, he must sit quietly in his place. Now, modern psychology teaches, what every common-sensed father knows, that activity is a necessity for the life and growth of the young child physically, mentally, and morally; that the young child is continually reaching out through his special senses to lay hold upon everything about him, to test it, to know about it, to see what its relation to himself may be, to see if he can use it and make something for himself with it; that he is an imitative being, delighting to say the sounds he hears, to represent the action which he sees and hears described, and, in fact, to live over, and so make his own, the different experiences of the people whom he sees, and of whom he reads.

"Now I desire to have every teacher of the training school do something which will help to change the spirit in the school. I shall not dictate as to what you shall do, but only suggest that you do something. I shall be glad to advise as to the particulars, but what I am most anxious about now is that you, in your own way, put in some kind of manual training which you can do and which will appeal to the children. Watch your children and *feel your way along*."

And so we started in a quite haphazard way, but with a desire to learn. For several years some of us had kept more or less in touch with this kind of work throughout the country, and one of our teachers had studied with Colonel Parker. I now spent a week in New York

FOURTH-GRADE CHILDREN CARRYING HOME VEGETABLES AND FLOWERS FROM THEIR OWN GARDEN IN BASKETS MADE BY THEMSELVES.

and Brooklyn hunting for forms of manual training in which the child's standpoint was most considered. One of our teachers was sent to New York to take lessons in basketry and weaving. A little later I went before the local school committee and showed it the things which we were doing and explained the theories which we were trying to work out. I asked the committee to lengthen out the school hours about forty-five minutes, so that we might have that time each day for industrial work without being open to the charge of crowding out the three R's. The superintendent of schools and the local school board gave their hearty approval, and we moved forward enthusiastically.

We gradually introduced into the primary grades of the school weaving, braiding and sewing mats, making baskets and hats, tagboard furniture, wall-paper, picture frames, portieres—all to be used in furnishing a dolls' house ; and into the grammar grades, basket-making with raffia and reeds, mounting of sea mosses, making of raffia hats, sewing, darning, cardboard construction, hammock-making, woodworking and bed-making.

In March we gave a school exhibit in which the regular work, as correlated with the newer industrial work, was shown. A part of this exhibit was also devoted to things made by the children in their homes without assistance from the schools. The purpose of the exhibit was mainly to increase the interest and enthusiasm of the people by helping them to understand what the school was trying to do and so to lead them to be glad to co-operate with the teachers. The result was all that could be desired, and we have felt that we could continue to move forward, sure of the sympathy of the parents.

MAKING HAMMOCKS.

Gradually the work has been modified and broadened. The effort has been made to find the work which would best meet the needs of the children of Hyannis and, at the same time, prove suggestive as to the kind of work which might be done in the other public schools of the state.

The reader will readily see that whatever has thus far been accomplished has been possible because we have worked together, each striving to do his part. At first one teacher taught gardening, another weaving, another basketry, another hammock-making, another bed-making, and our special teacher in music offered his services as a teacher of printing. Gradually, however, each teacher learns how to teach those things which are considered best for her room. When vacations come, each teacher tries to learn some new industry which may seem desirable for introduction. Several have learned bookbinding, others cane-seating, others how to make rattan footstools. These arts are not, however, imposed upon the children from without, but are given in response to some apparent need or desire on the part of the school. For instance, the little children go out into the fields to study nature, then make their own stories for language and reading. It seemed desirable that these stories be printed and bound into simple booklets for the children to keep. We, therefore, bought a small printing outfit, and some of the teachers took lessons in bookbinding; and now the upper grade boys are learning how to print and bind books for the little folks.

We have a theory that the home is the natural place in which to educate young children. Young animals are educated at home. Among uncivilized peoples the children were educated in the home. As the demand for trade and business relations appeared, there came a need for instruction in the three R's. The boys were taken out of the life of the home and the fields, and put into a box with an instructor as drill master, and forthwith this became the typical school. As other subjects were gradually added to the curriculum, the type was followed, and the history and geography of our childhood were drilled into us

AUNT JEMIMA TEACHING A NORMAL TEACHER HOW TO MAKE SPLINT BASKETS WITH LOCAL MATERIAL.

without any connection with life. And so, when some wise people saw the value of sloyd, as the children of the peasants used it to help their parents earn a living, it was accepted as a new subject in American schools, but, in most cases, it followed the afore-mentioned type, was imposed upon the child from without, for the sake of drilling him in observation, motor adjustment, accuracy, will-power, etc., and did not, in any way, grow out of the life of the child.

Manual training, as we conceive of it, is not an isolated subject demanding admission to an already overcrowded curriculum. It is the appropriate basis for all true education of the child. It recognizes the fact that to educate is to help a child to grow in a natural, harmonious way, from one stage of his development into the next. That to grow the child must be active, and that the best growth will come only when the activity of the child results from his own inner needs. In other words, it is the recognition of the natural demand of the normal child that he be doing something. Manual training has always recognized

this, and the best manual training has also appreciated the fact that *the something* should be interesting. Some kinds of manual training have gone a step farther and have said that it must have a personal interest ; but very few have urged, as we do, that the activity must grow out of the very life of the child: must come as an expression of the inner being of the child. An illustration may be seen in real life when a country boy is given a hen and some eggs, with the understanding that he may have half of the profits if he will care for the hen and the young chicks. The boy becomes at once very anxious about the food and nest for the hen. He sets to work to make a coop, besieging his father and mother and the hired man for suggestions and assistance. He takes lessons of the neighboring carpenter. He does not learn first how to saw to a line, nor does he take lessons in driving nails, but he makes a coop that will answer his purpose.

In much the same manner, when children were told that if each would make two hammocks he might have one for his own, everyone became anxious to whittle out the tools and to learn how to make the hammocks. And when each girl of the sewing class was given an opportunity to select that which she desired to make for herself or for some member of her family, one girl desired to make an apron for her grandmother, one a handkerchief for her mother, another a hand-bag for herself. Every girl became very anxious to learn to sew well enough to have the article well made.

Under this arrangement the children become the anxious ones, asking for assistance and suggestions which the teacher stands ready to give. This is the reverse of the attitude of the ordinary school where machine-like methods are pursued.

At this stage the visitor usually asks for a printed outline or course of study. We have none. We are afraid of them. Our work is very crude and new, but it is full of virility. We are continually modifying our outlines to fit the varying needs of our children, as these needs are revealed to us. We believe that no outline should be exactly duplicated in two different places nor in two different years. Such duplication leads to formal teaching and spiritual death. We prefer to keep the flexibility and adaptability of life, even if the external results are crude and unfinished. Perhaps it ought to be said here that we do not strive for the accuracy of the machine, nor even of the adult, but for the best work of which each child is now capable. If he does not do his best work, then we strive to change his attitude, as we feel sure that this is at fault. We are anxious to build up the child from within.

INDUSTRIAL CLASS, SUMMER SESSION OF 1902.

We would not have you think that our work has no basis in principles, for we are striving to be guided in all our school work by the fundamental principles of child-development. We have taken as our motto, "A live child in a live school;" learning to live by living each day in the school.

In planning work which will best develop the child, we try to study those conditions which have been best for child-development in the past, and they seem to be found in the ideal home. Our model is, therefore, the complete home, full of children, where the father and mother and the elder brothers and sisters are helping to make life more beautiful and wholesome for the younger members of the household and for each other. Every school problem is illumined, if not wholly solved, by considering what would be done under like circumstances in such a home. The nature of the child must be considered —not that of the wild, untutored child of Rousseau nor yet of the self-willed child of some modern homes, but of the child as he is in an ideal home, subordinating his will to that of the father or mother and learning to co-operate for the good of the whole family.

The first and fundamental lesson of child-life is that of subordination to his superiors, the adaptation to environment, both physical and social; the second is that of gaining thought from environment; the

third is that of the expression of his own individuality in terms of physical activity; and the fourth is that of co-operation or the voluntary expression or repression of self for the public weal. The industrial work should, therefore, give opportunity for impression, expression, and repression. It should give opportunity for both the imitative and creative sides of child-nature. We would make industrial work the center of all school life, just as physical activity is the center of all child-life out of school. We would have all other school work grow out of and be correlated with this. The child should gradually grow into an appreciation of the need of the other forms of school work to help him in this.

The teacher helps the child to answer the many and varied questions that arise in connection with his industrial work, and he comes to understand, through his own experience, and the questions arising out of his own experience, all that he is able to understand of life in other parts of the world, present, past, and future. He thus comes to be master of himself and of his environment. He will hold the keys of his own destiny in his own hands and become conscious of his power for good in the world. He will come to understand the past through the present and the future through the past and present.

We are trying to base the work of the school upon the life out of school, and to help the child to base his life out of school upon his life in school. This makes our problem a social one, reaching out to the whole community. The school becomes the center of the life of the community, just as the development of the child is the principal business of the ideal home. And just as the proper development of the child in the home is often the salvation of the home, so the proper development of the children of the community will become the salvation of the community, and the school will become the center of the new democracy.

WILLOW BASKETRY.

LUTHER WESTON TURNER,
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AFTER two school terms' work in basketry with rattan and raffia it occurred to the writer to try willows as a medium of construction. The knowledge of simple basketry is therefore assumed.

Willows are native in temperate Europe and only adventive in the United States. Their growth is confined almost wholly to the northern hemisphere, they being very rarely found in the tropics. There are at present over twenty varieties in the northern United States and Europe.

The three varieties commonly used for baskets are known botanically as *Salix vitellina*, or golden willow; *Salix viminalis*, or velvet willow; both of which are found native in temperate Europe; and *Salix cordata*, or heart-leafed willow, which abounds in the northeastern United States. All varieties are usually found beside some small stream or on the edges of a marshy lowland. The yearly growth is from two feet to five feet in length, and only the yearling growth is cut. They must have the skin removed as soon as cut, and for this purpose an old-fashioned clothespin is a good tool. Put about 6 in. of the butt of the willow between the prongs of the pin and pressing them together pull the willow through and the skin will peel off very easily. Turn the willow and peel the rest of it in the same way.

The best grade known to the trade is called Belgian white willow.[1] A general assortment not over four feet long will be found to contain several sizes. These must be culled out according to lengths and sizes at the butts. Fig. 1 (*A*) shows a bunch as purchased and Fig. 1 (*B*) shows a bunch of the same size after grading into three or four sizes. The largest of these are to be used for the ribs of the bottoms and also for handles; the smallest, for the weavers of the bottoms; and the medium sized ones, for the vertical spokes and weavers for the sides.

The common weaves used are shown in Fig. 2. No. 1 is the com-

[1] These can be bought in any quantity of Edward Voigt, 725 North Second street, Philadelphia, Pa., at prices varying from 8 to 12 cents per pound, according to size and quantity purchased. An especially fine willow can be purchased, in *small* quantities, of Albert Stoll, Esq., corner of York and Chestnut streets, Pottstown, Pa. These are raised from imported roots and are very strong and fine.

mon in-and-out weave with ends started inside; No. 2 is the same, with weaver started outside; No. 3 is the pairing weave; No. 4, the triple weave; No. 5, the quadruple weave or rope twist; and No. 6 shows two willows used as one weaver. This is termed double weaving and is a simple, fancy weave. In pairing, in triple twist and in rope twist always weave with the willows joining tips to tips and butts to butts, and start and leave off the weaving with the tips.

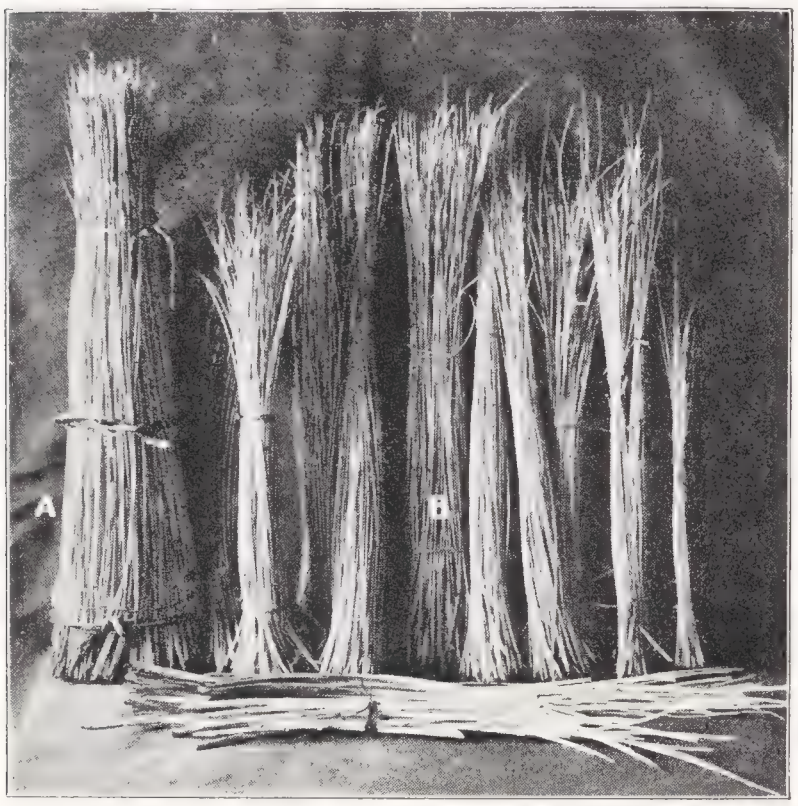

FIG. 1.

It is necessary to soak all willows until they become pliable. About fifteen minutes in hot, and from an hour to an hour and a half in cold water is sufficient time for soaking. When properly soaked they may be bent perpendicularly at the butt without breaking. It will be found convenient to have a water-tight box about 4 ft. 6 in. long by 8 in. square at the end, for soaking willows, as this will leave them straight.

Let us suppose that a common waste-paper basket is wanted. From the butts of eight large willows cut eight pieces about $\frac{1}{4}$ in. or $\frac{5}{16}$ in. in diameter and 8 in. long, using a pair of heavy trimming shears. Split the middle of four of these long enough to admit of the four others passing through them. Take care to have both groups central. Hold the groups so that the split ones will be in a vertical position and consider the inside of the bottom to be always toward you.

Select two tough willows of small diameter and insert the tips, from the left and above the horizontal group, through the vertical group of spokes, letting the tips project toward the right about an inch, Fig. 2 (*A*). Bring one willow to the right across the face of the vertical group and down behind the horizontal group, thereby binding the tips of both willows to the upper edge of the horizontal group. Carry the other willow to the right, behind the vertical group, and bring it out in front of the horizontal group and down. This one

holds the other one in place and again binds the tips of the two weavers. Fig. 2 (*A*) shows the bottom at this stage with one willow each side of the horizontal group.

With the pairing weave, go around three times and then separate into groups of double spokes, Fig. 2 (*B*). Weave around these two or three times and separate into single spokes, Fig. 2 (*C*), weaving nearly to the desired diameter with the pairing weave.

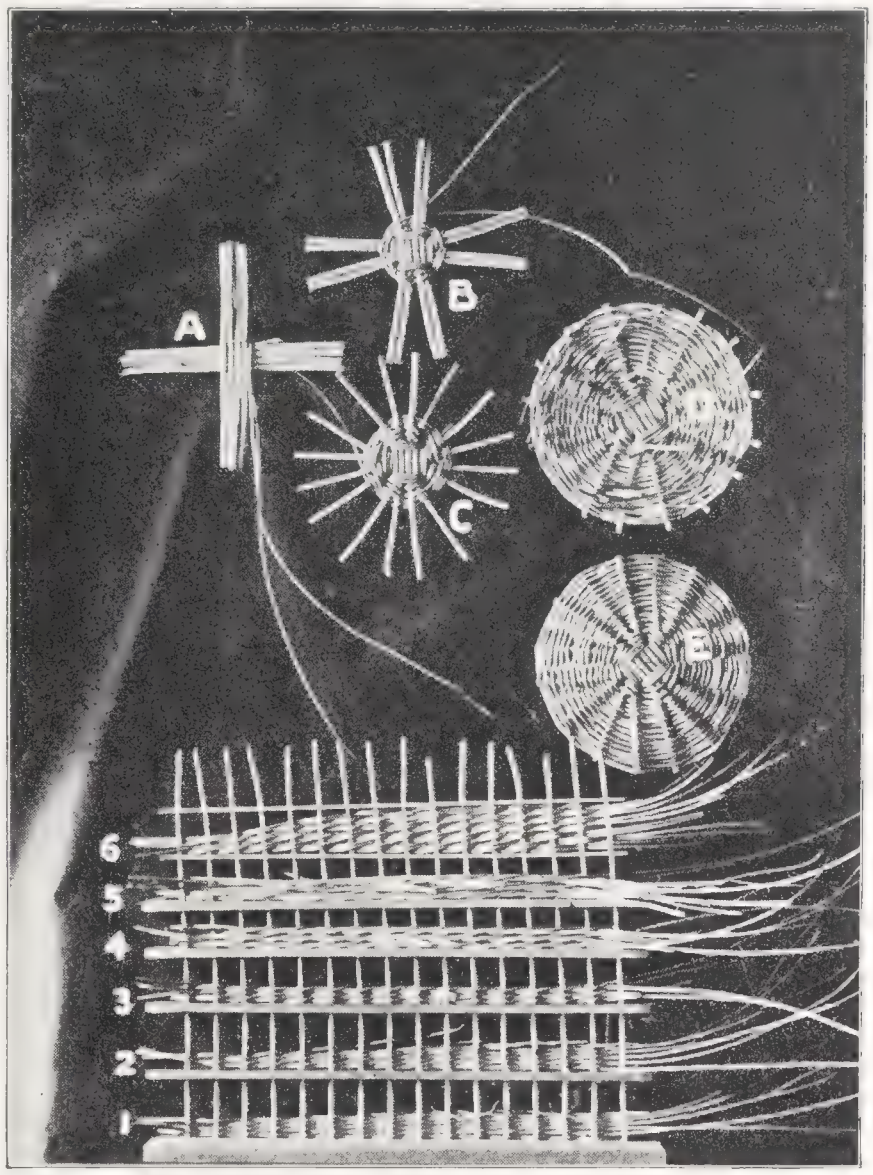

FIG. 2.

While weaving the bottom, care must be taken to press the ribs backward. This will cause the bottom to crown a little and allow the finished basket to sit firmly on the floor on the circumference of the bottom.

All willows used for weaving the bottom are commenced at the tips. These tips are tucked down beside one of the spokes in such a manner as to hold the butt of the previous willow, which is left projecting on the back side. This butt is afterward cut off.

Finish weaving the bottom with two willows long enough to *more than go around* its circumference.

These *two* are to be *commenced* at the *butts* and their tips tucked down beside a spoke and out through the weaving where convenient. This will hold the butts of the pair, and also all previous weaving, firmly in place. Fig. 2 (*D*) shows the back side of the bottom, untrimmed and Fig. 2 (*E*) shows the face of the same with the ends of the spokes trimmed off.

Select thirty-two straight willows of uniform length and about $\frac{3}{16}$ in. in diameter at the butts. Sharpen the butt of each and insert one on each side of the spokes of the bottom, pushing them as far in as possible, Fig. 3 (*A*). Bend each one of these up perpendicularly to the bottom and put a ring around the whole to hold them in position, Fig. 3 (*B*).

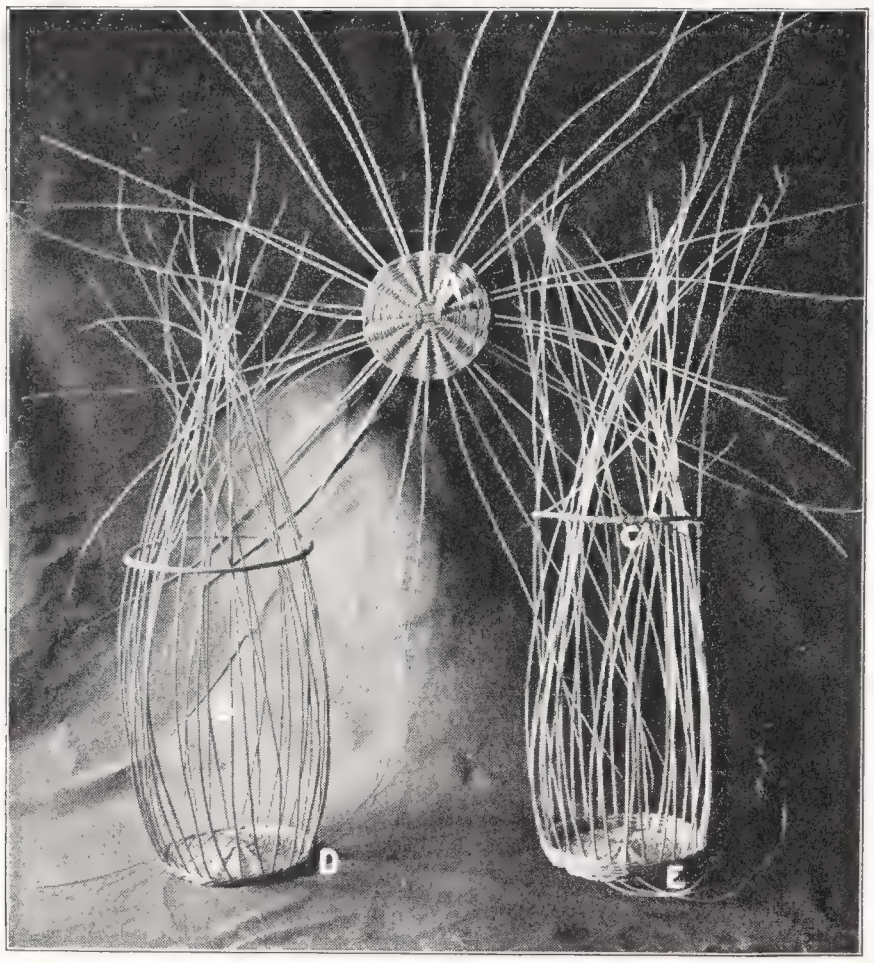

FIG. 3.

This ring is made of a long willow carefully bent into a circle about 9 in. in diameter and held together with stout string. It is held in position by winding the tips of two or three willows around it about 18 in. from the base as at Fig. 3 (*C*).

Take six long willows about $\frac{3}{16}$ in. in diameter at the butt and insert a group of three, on opposite sides of the bottom, beside three consecutive vertical spokes. During all weaving, hold the basket in the lap and let the vertical spokes go directly away from you. A low chair will be found better for use than a high one.

Weave one set of the above willows, with the triple weave, from left to right, until the butts of the next set are reached. Weave the second set around to the butts of the first set and continue weaving, first one set and then the other, until only short tips remain, Fig. 3 (*D*). Pull these weavers tightly while weaving, and, before starting others, hammer these down closely together, setting the basket on any convenient surface. For driving weavers together use a piece of hard wood about 12 in. long, 1½ in. wide, and ⅝ in. thick with the edges planed off so that they may not cut the weavers. Just at this stage great care must be taken to get the vertical spokes as nearly the same distance

apart as is possible. This point must be kept constantly in mind during all the weaving process.

Take six more weavers, shorter than the first, and continue this triple weave as before, inserting the tips of these willows beside the vertical spokes where the last tips left off. When these are woven in hammer them down and weave another set, starting *butts* to *butts*. Fig. 2, No. 4 shows three of these butts sticking out. Insert new willows by placing them behind these butts and proceeding as though the weavers were continuous.

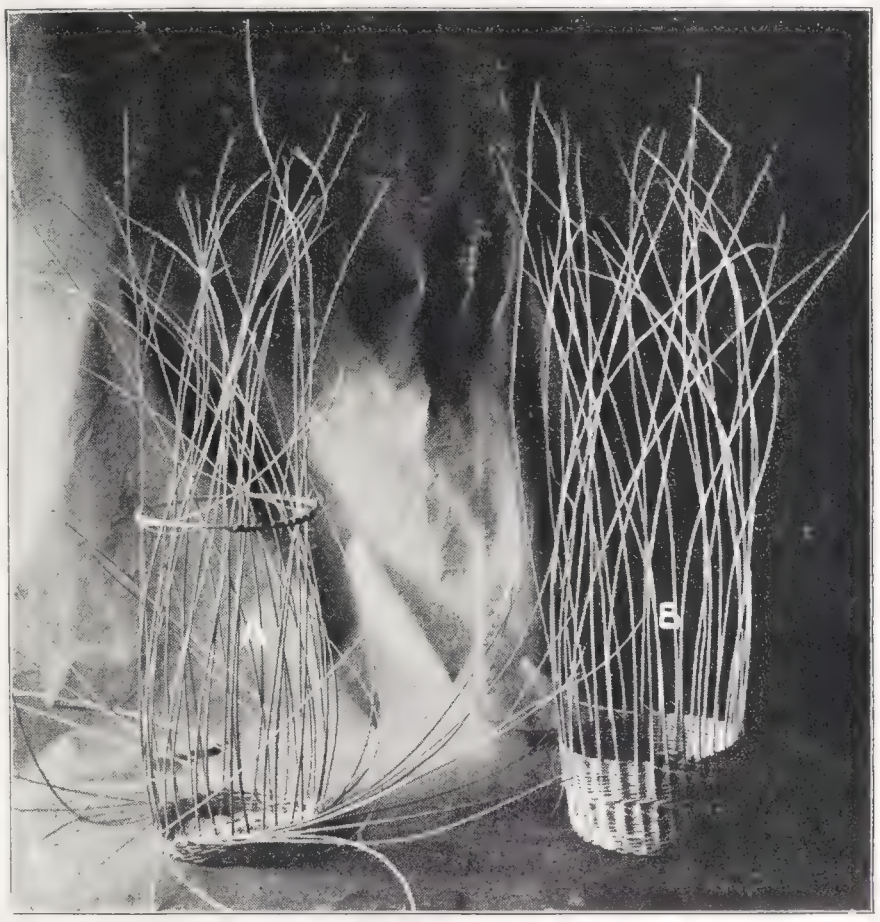

FIG. 4.

When this last set is about half woven in, tuck the ends down beside three consecutive ribs, on opposite sides of the basket and pull through tightly. This will hold the triple weaving, which now forms a solid band around the bottom of the basket, and also will hold the vertical ribs at equal distances apart. Fig. 3 (*E*) shows the band and also the tips of the three willows pulled through.

Carefully select thirty-two willows about 24 in. long and as small in diameter as possible, as weavers for the first bank of weaving. Put the butt of one willow behind a vertical spoke, bring the willow in front of the next vertical spoke to the right, behind the next to the right and out. Insert the rest, moving the basket from left to right, until the thirty-two are inserted. The basket now has one weaver coming from behind each vertical spoke, Fig. 4 (*A*).

Weave these half way in using the single weave. Be careful to see that each willow lies on top of the one next to the right of it. The ring may now be taken off and the basket allowed to flare a little. Beat the bank of willows closely together and weave until about 3 in.

of the tips remain out. When the weaving is stopped one tip will come from behind each vertical spoke. Do not beat down these tips until the next bank of willows is *inserted.*

Select thirty-two willows as before and insert as follows: Put the butt behind one vertical spoke; bring the willow in front of the *next two* to the right, behind the next to the right and out. Insert the thirty-two in the same way, moving the basket from left to right and putting each willow on top of its predecessor. Notice that the *insertion* of the second bank, and all succeeding banks, *is different from* that of the *first* bank. *After insertion,* however, the *weaving* is the *same.*

FIG. 5.

Before weaving in the second bank of willows beat down the first one. Measure carefully the distance from the surface on which the beating down is done, up to the top of the first bank of willows, and see that the distance is the same all around the basket. By measuring carefully at each spoke, the bands formed by the insertion will be parallel to each other, and to the surface on which the basket may sit. Fig. 4 (*B*) shows the first bank woven in, the band formed by the insertion of the second bank, and the second bank woven in.

With a sponge or piece of cloth wet the vertical spokes occasionally in order to keep them pliable for binding off the border.

As many banks may be inserted and woven in as are desired to make the basket the proper height. This must be governed entirely by the taste of the maker. Fig. 8 shows examples of one, two, three, four, and five, banks of weaving.

When the basket is nearly the required height, weave a few rows of triple weaving around the top before starting to bind off the border. Commence this triple weaving by inserting the tips of three willows beside three vertical spokes and use enough willows to end off with tips, so that they may be pulled down through the weaving and hold it firmly in place. Carefully beat down this rim until the top of it is parallel to the surface on which the basket sits. Fig. 5 shows this rim on a shallow basket, which is all ready for the binding off of the border.

Bind off as follows: Turn down five upright spokes, taking care to *leave up loops high enough to tuck in the ends of the finishing willows*

when completing the border. No. 1 goes behind No. 2, 2 behind 3, 3 behind 4, 4 behind 5, and 5 behind 6. Fig. 6 (*A*). Pick up No. 1 and carry it to the right across the outside of Nos. 3, 4, 5, and 6 and behind No. 7. Bring No. 6 (which is still upright) down behind and beside No. 1. See that they lie *side by side* and *not one on top of the other*. From this point begin to weave the border a little more closely. Pick up No. 2, carry it to the right, in front of No. 7, and behind No. 8, bringing No. 7 (which is still upright) down behind and beside it.

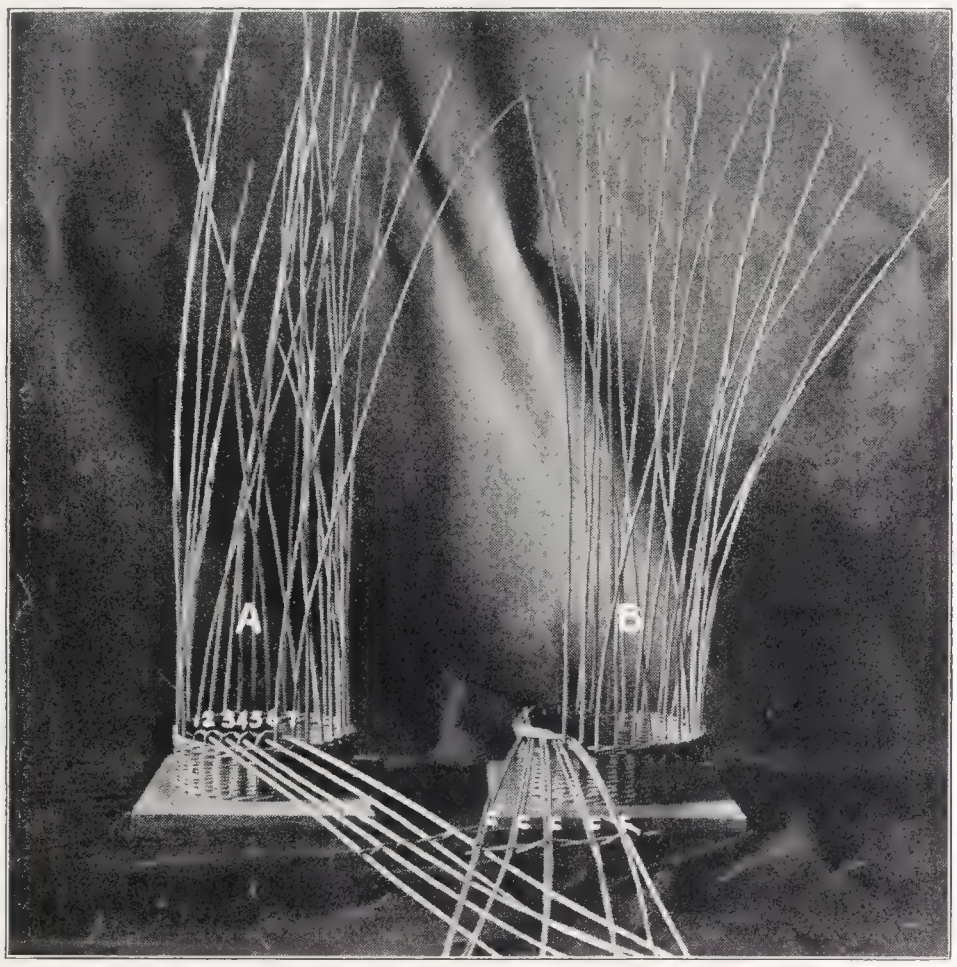

Fig. 6.

When 1, 2, 3, 4, and 5 are disposed of in this manner, the spokes will be found to be in five groups of twos. Fig. 6 (*B*). If the tips were all of equal length, before the binding off commenced, each pair will now be found to contain a longer and a shorter end. The longer end is called the forward willow and is the one farthest to the right in each group. Fig. 6 (*c*, *c*, *c*, *c*, *c*). Take the forward willow of each pair, and proceed as before until only the last willow is left standing, Fig. 7 (*A*).

The forward willow of the left-hand pair is now brought in *front* of this one left standing and behind and through the loop left up by No. 1. This last standing willow is then brought down behind and beside

it as in all previous cases. Fig. 7 (*B*) shows this last pair before they are pulled down into place.

Carefully notice that there are now five pairs of willows left sticking through and that just to the right of these there are five places, which have nothing projecting from them. Fig. 7 (*B*). Take the forward willow of the left-hand pair, bringing it to the right in front of No. 1 and behind and through the loop left up by No. 2. Be careful to see

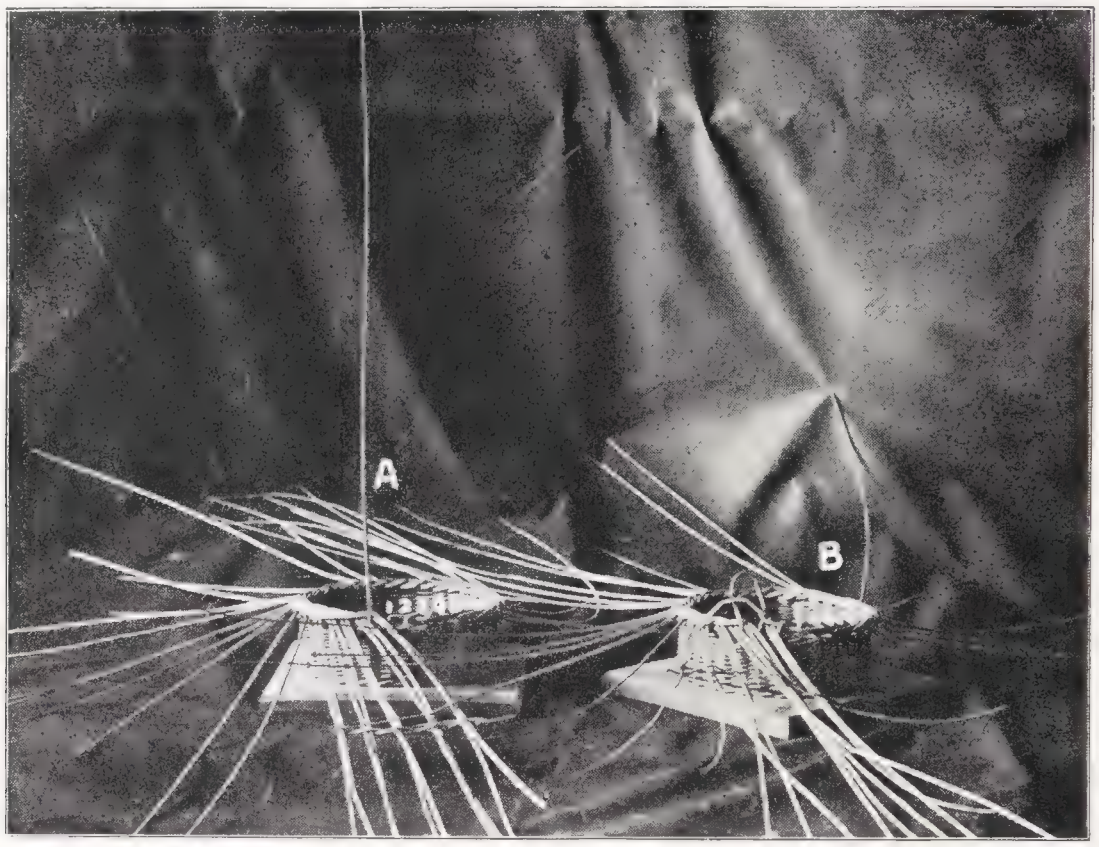

Fig. 7.

that this willow comes in front of No. 1 willow when it passes through this loop.

Take the forward willow of the left-hand pair, of the four pairs left, and bring it beside and in front of No. 2 and behind and through the loop of No. 3. Treat the three remaining pairs in the same manner and a tip will project from behind each vertical spoke just under the roll of the border. Pull all these ends tightly, especially the first five. This will pull down the first five loops tightly into place. Cut off all projecting ends, and all butts, both on the inside and outside of the basket, using a sharp knife. This cannot be done with anything but a knife, as it will be found impossible to get trimmers close enough to the weaving to trim off the ends neatly.

The basket is now ready for handles. Fig. 8 (*A*, *C*, and *D*) shows the common handles used on work and waste baskets. Fig. 8 (*B*)

shows a market basket handle and (*E*) shows an arrow quiver, the strap loop of which has not yet been attached.

Fig. 9 (*A* and *B*) represent the construction of the handle shown on Fig. 8 (*C* and *D*). The small piece of wood represents the roll of the border. A stout piece of willow about ¼ in. in diameter and 12 in. long is sharpened on each end and carefully bent. One end of this is inserted beside a vertical spoke and the other carried to the

Fig. 8.

right, and pushed down beside the fourth vertical spoke from the first. It is then wound with either a split willow which has been scraped down very thin, or a piece of cane similar to that which is used for cane-seating chairs.

If the latter is used get the wide kind in preference to the narrow. Fig. 9 (*A*) shows how this is commenced at the right and wound around the foundation willow toward the left. Fig. 9 (*B*) shows (1) the cross on the outside and (2) the appearance of the same on the inside.

Fig. 9 (1, 2, and 3) represents the successive steps in making the twisted handle shown in Fig. 8 (*A*). After two medium-sized willows are inserted, with four vertical spokes between them, each is twisted beginning at the tip. Fig. 9 (1). Twist four or five inches at a time, holding the willow with the left hand and twisting with the right.

When the whole willow is twisted its grain, instead of being straight, is spiral like the twist of a rope strand. In this condition the willow may be twisted about itself with perfect ease. Commence with the right-hand willow. Bring it outside of the basket, through to the inside of the basket just to the left of the other willow, and below the border. Leave a loop for the handle high enough to suit the taste. Next twist it about itself, toward the right, four times. Bring down under the border and to the outside of the basket. Now take the left-hand willow, which has been left standing, Fig. 9 (2), and twist it about the other toward the right, keeping it always running *beside* the other two. Care must be taken not to let it *cross* the others. When it comes to the right hand of the handle, put it through the border and start it back toward the left hand of the handle, still having it follow along beside the other twists. The end of each willow may now be pulled through the border and tucked into the triple weaving where convenient. Fig. 9 (3) shows the finished handle.

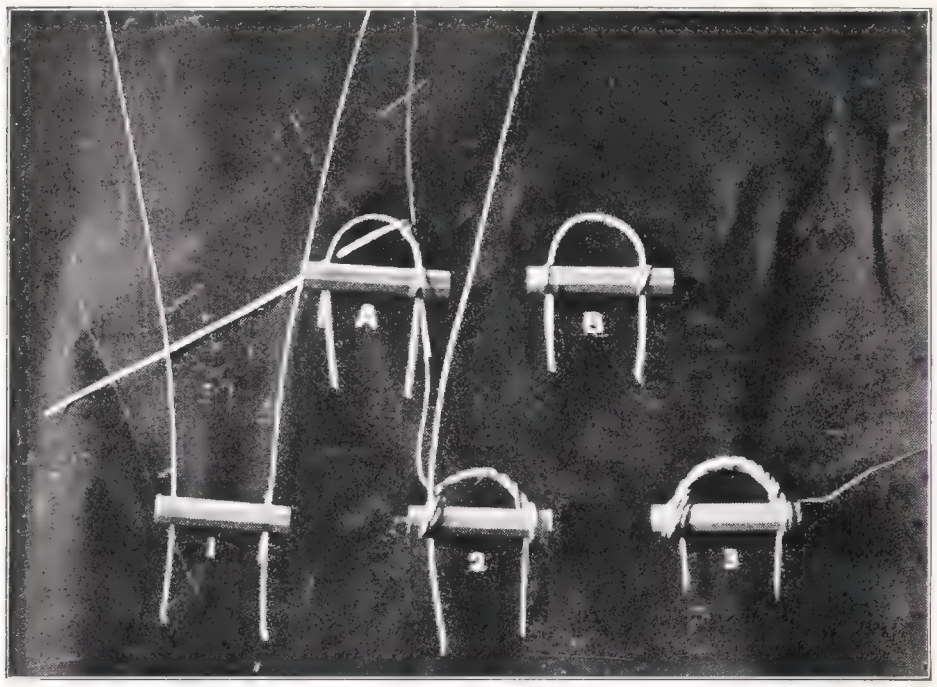

FIG. 9.

The foundation of the handle on *B*, Fig. 8, is a piece of white oak about ¾ in. wide and $\frac{3}{16}$ in. thick, wet thoroughly and bent to the required shape. It is put in when the first triple weaving commences, and, with the two vertical spokes beside it, is treated as though it were a single spoke, the weaving going clear across it, inside and out. The handle is wound, after the border is bound off, in the same manner as the one shown in Fig. 8 (*C*) which has been previously described.

WORK OF STUDENTS—SECOND-YEAR HIGH SCHOOL.

METAL-SPINNING.

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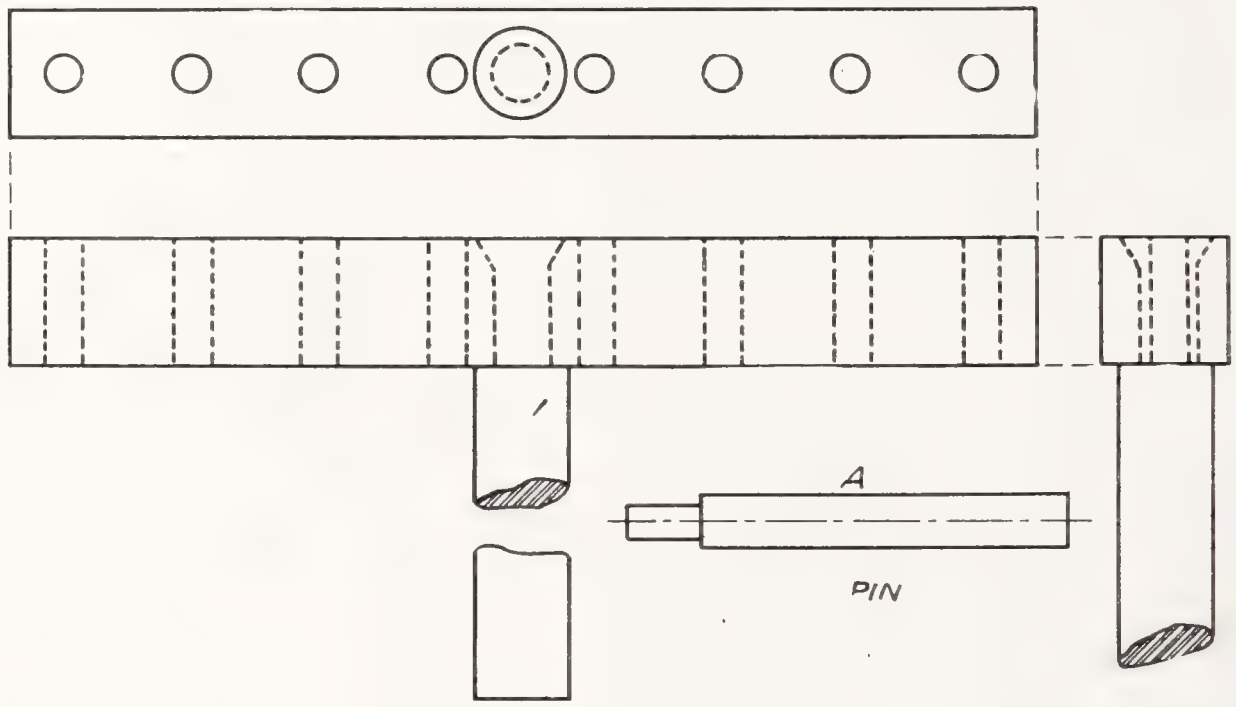
IN the April, 1902, number of this MAGAZINE there appeared an article by the editor entitled "The Organization of Manual Training in High Schools." The second part of the article was descriptive of a course of study in manual-training metalwork which is given in the second year of the lower academy—corresponding to the second year of high school—in Bradley Polytechnic Institute. Metal-spinning is mentioned in this article as one of the subjects taught in this course. It is the purpose of the writer to illustrate and describe the process of spinning cold sheet-metals.

Sheet-metal, which is now pressed and stamped into a great variety of forms for commercial uses, was, up to a few years ago, either hammered or spun into the desired shapes by a comparatively few artisans who had learned the art of cold-metal working in Sweden or Norway. Like so many other of the old-time crafts, the one of metal-spinning has partially come into disuse because of commercial competition and the failure of the younger generation of men to familiarize themselves with the handwork of their fathers. In the United States it is only in the larger cities that one occasionally finds an artisan who does metal-spinning; when such a person is found, he is usually occupied in producing forms out of thin metal that require great care in making or are difficult to produce with a stamp or press. Sometimes, however, where only a comparatively few articles of any particular shape are desired, they are spun instead of stamped out, to save the first cost of dies; again,

as in chandelier work, nearly all parts are spun by some manufacturers either because they believe the hand product superior to that of the machine or for economical reasons alone.

The metals used in spinning are those which are pliable and do not easily harden under the pressure of a blunt tool which, in every case, the spinner uses. Annealed sheet-copper, brass, zinc, and aluminum of twenty-four or twenty-six B. and S. gauge are all serviceable in this work; each, however, offers some difficulty in manipulating. Copper,



SPINNERS REST

FIG. 1.

though ductile and not easily shattered, soon hardens, due to the friction of the tool, and must be annealed constantly during the process of spinning. Brass and zinc are rather too brittle because of a crystalline structure, and aluminum is not easily accessible in quantities and thicknesses desirable. Recently a metal which bears the name of Britannia metal, but which is believed not to be the same as the old composition of tin and antimony known as "Britannia metal," has been used by the writer since it does not offer the objections referred to above. It is capable of being either compressed or drawn out under the action of the spinner's tool without hardening or easily shattering. Furthermore, it is at present the base for nearly all plated ware and therefore may be used with this end in view in metal-spinning.

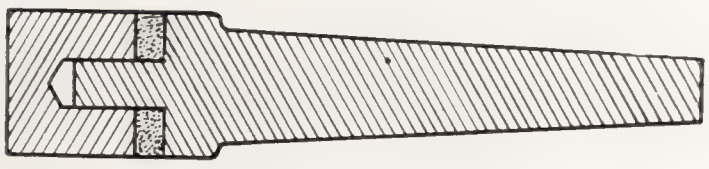
The equipment necessary for spinning sheet-metal is as follows:

1. One good speed lathe with the ordinary attachments for wood-

turning, and, in addition, one spinner's rest, illustrated in Fig. 1, and one spinner's center, of which there are two good forms shown in Fig. 2.

2. Four or five spinner's tools, of which the principal forms are shown in Fig. 3. Tools of these patterns were used in spinning all the forms illustrated in this article; the ones used most were the round-nose and the tongue tool, and they are sufficient, I should say, for a school equipment, although the others may be used to advantage in some cases.

TOOL IN HANDLE



SPINNERS CENTERS

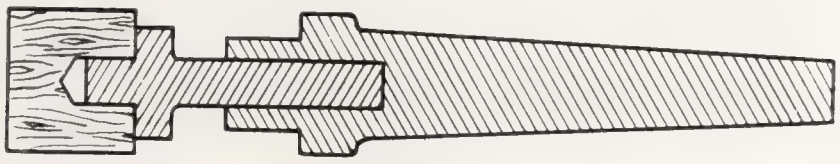


FIG. 2.

Since, with the exception of the spinner's center, none of these tools are kept in stock by dealers, they must be made by the workman. I have found that few spinners use the same tools in similar operations; they are constantly constructing new tools for special work. In fact, it is quite possible to reach the same results in spinning by using quite different tools and often different methods of operation. To illustrate this, the raising tool may usually be substituted by the roundnose, and both these tools, although used a great deal in general, may often be laid aside and the tongue tool used in their place. Again, the writer has found that neither of the spinner's centers illustrated are as service-able in general as is the ordinary cup dead-center of the woodworking lathe with a small circular piece of wood placed between it and the

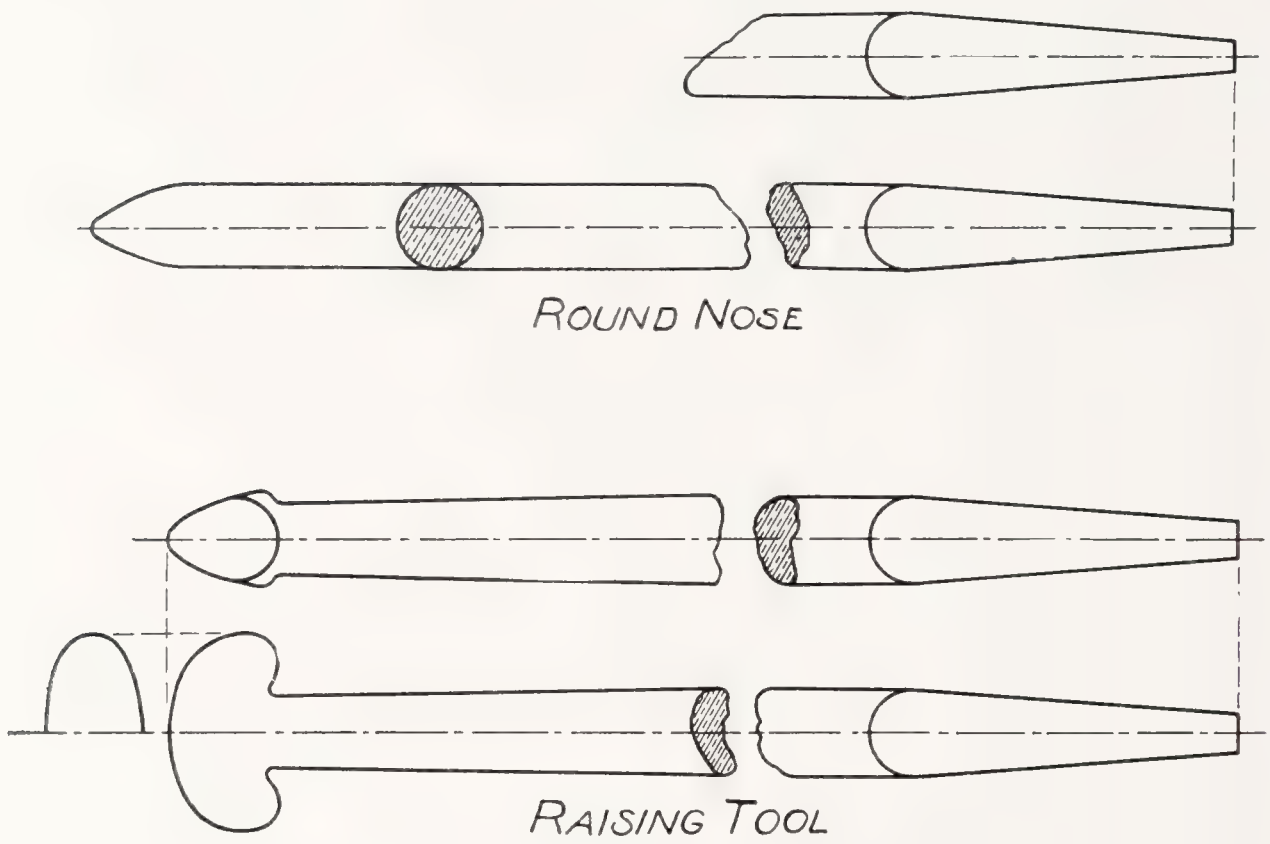


FIG. 3.

work being spun. The reader is referred to Fig. 4, illustrating a spinner at work, and to a later description of operations, for a better understanding of the above statements.

A few words concerning the construction of the tools may help those who wish to introduce this work. The rest illustrated is made of one-inch square wrought iron, in which are drilled the several vertical holes to admit the small end of pin *A*, Fig. 1. This pin forms a side rest for the spinning tool. The lower portion of the rest is turned round to fit into the lathe carriage, and is fastened to the upper part by riveting down the small end which passes through the hole drilled in the piece of square section.

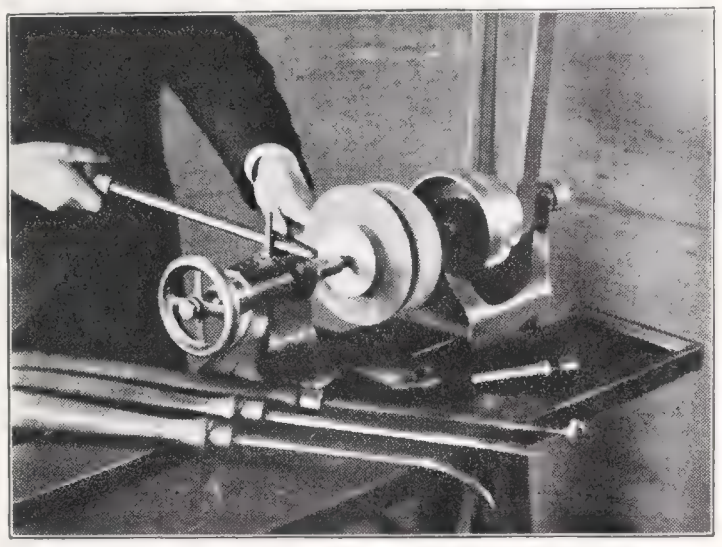


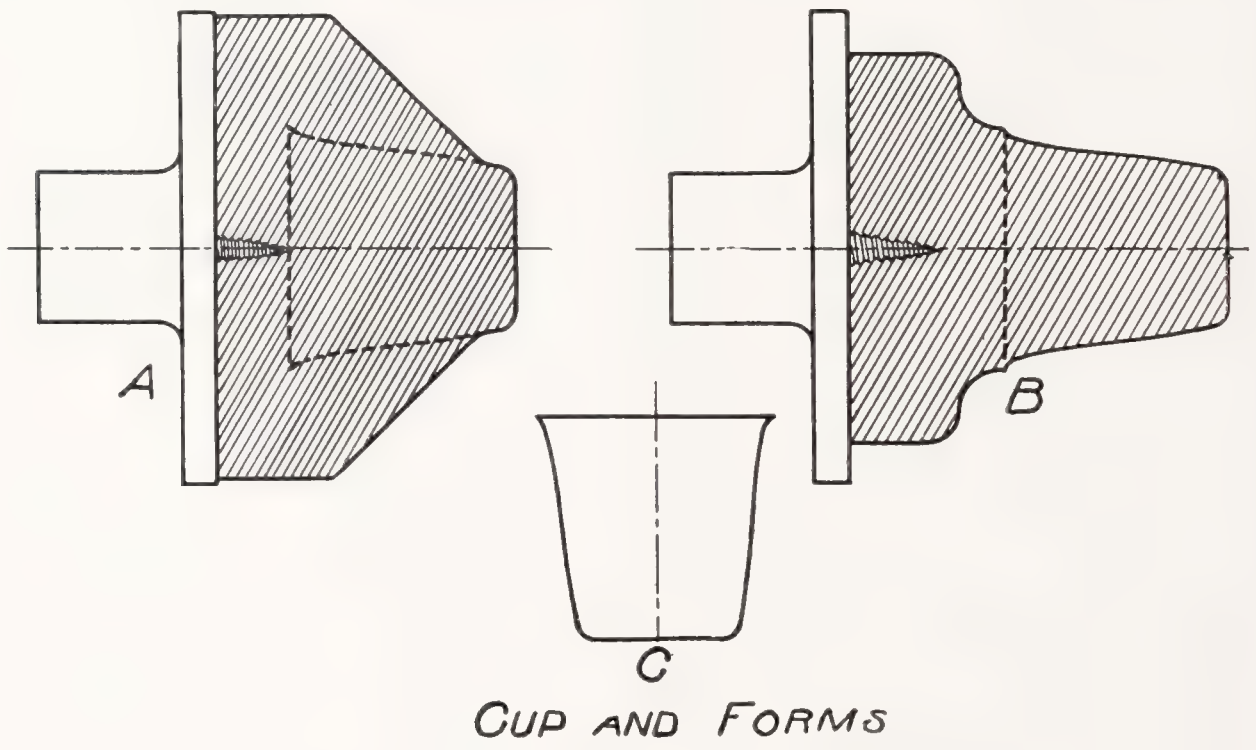
FIG. 4.

The upper center in the illustration, Fig. 2, is constructed of two pieces of cast iron, with a vulcanized fiber washer between them. The lower center is constructed of two pieces of cast iron, with a wooden cylinder on the end, as shown.

The spinner's tools, Fig. 3, are made about fifteen inches long from five-eighths or three-quarter-inch round or octagonal steel, and carefully hardened, tempered, and polished with all edges rounded. The handles for these tools approximate one foot in length and are about one and three-quarters inches in diameter in the heaviest part. The tools are very securely driven into the ends of the handles, over which a strong ferule is first placed (see Fig. 2). The ferules used on the tools at Bradley Polytechnic Institute are made of one and one-eighth-inch gas pipe.

The relative position of the metal, while being spun, and the tools spoken of above, is well shown in Fig. 4. A circular disk of metal, large enough to form the desired object, is held by friction between the wooden form fastened to the face-plate on the head-stock, over which the metal is to be worked, and the spinner's center—or cup dead-center and disk of wood above mentioned—and occupies the place of the dead-center in the tail-stock. As the work revolves at a speed of one thousand or twelve hundred revolutions per minute, the operator holds the spinner's tool against the right side of the disk of

metal, and lays it on the rest and against the rest-pin with the handle under his right arm; the end of the tool being below the axis of revolution of the work. With his left hand he holds a circular piece of hardwood — the end of a broom handle is satisfactory — obliquely sawed to form a flat surface, which is firmly held against the left side of the revolving disk of metal, and directly opposite the tool end. The tool moves with a firm pressure against the metal from the axis of revolution to the outside of the disk and back again, being supported constantly by the wood in the left hand to prevent buckling.



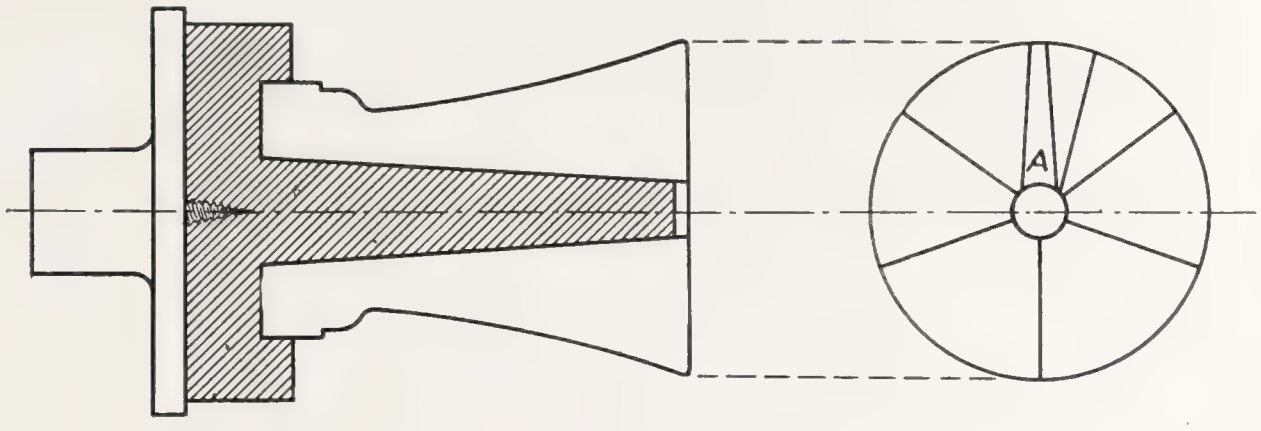
CUP AND FORMS

FIG. 5.

The outward motion of the tool presses the metal over the base of the wooden form and centers it in the lathe. A few outward strokes of the tool are necessary at first to draw the metal over the form as soon as possible in order to gain a firm contact between metal and form. This operation insures the constant revolution of the disk without slipping.

After this contact has been secured between metal and form at the axis, the problem of spinning the outer portion of the metal absorbs the attention and skill of the workman. Generally speaking, the tool is worked toward the axis of revolution after the base of the object is formed. This constantly compresses the metal and counteracts the natural tendency of the metal to thin under the action of the tool. One must not attempt "spinning in the air"—as keeping the metal between tool and stick is called—too long, but must work the entire disk on to the form as soon as possible.

For this reason, except in spinning shallow dishes, several forms may have to be made, each more nearly approaching the shape of the desired one, and the metal spun upon each of these in order before the desired shape is obtained; this is illustrated in the cut showing "cup and forms," Fig. 5. The metal is first spun over a form turned as shown in *A*, where it gets its final shape at the base of the cup which gives a contact to hold metal on the form. After the shape *A* is obtained, the metal is slipped off, when the contour of the form is changed to that of *B*.



SPLIT FORM

FIG. 6.

If, now, a form is desired where the neck is smaller than the base —as is the case in the bonbon dishes, dish with arms, and pepper shaker shown in illustrations—some scheme must be devised whereby the form may be taken from the metal after all spinning is completed. One of two methods has been used at Bradley Institute. The first is common among old spinners; the second has been used where only one article of a particular form has been wanted. The first method is to construct a wooden form of the exact shape of the desired article to be spun. Drill a hole through the center of this form and ream it to a slight taper with the large end of the reamed hole nearest the face-plate of the lathe. Turn a pin which exactly fits this hole. Now split the form into a number of pie-pieces, with the exception of one piece which is called the key, and is larger at the center than at the outside, Fig. 6. Place all these pieces about the turned pin and surround the whole by the metal which has already been spun to the cylindrical or cup form, having the same contour at the base as has the split form just described. Complete the spinning; withdraw central pin, when the key, *A*, will fall into the center, and after it, as it is removed, all the others will follow.

The second method is similar to the first, except that the final form is sawed into pie-pieces, with the exception of the one key-piece, with the bottom of the saw kerfs remaining at a distance from the center not greater than the smallest inside radius of the spun article. After spinning is completed, the whole form is reversed in the lathe and put

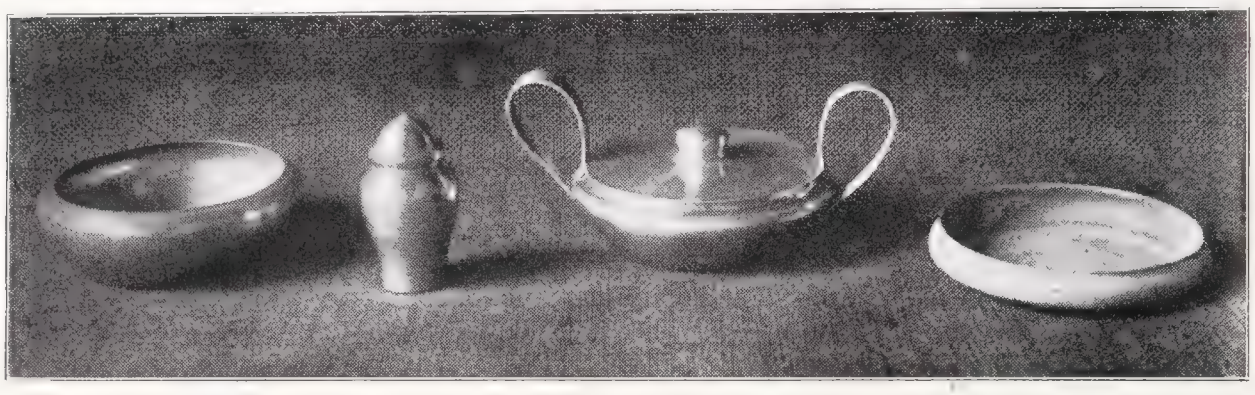


FIG. 7.

into a cup chuck, when the core of the form is chucked out. The key-piece now falls into this space, followed by the pie-pieces as in the first method.

The above description, aided by the illustrations, it is hoped will give the reader a fair idea of this interesting work, which seems to have great possibilities in it for manual-training purposes. It is believed that all the articles shown in the illustrations may be spun by students of high-school grade. Certainly, many very creditable dishes have been produced by our manual-training classes, and recent developments, which are the result of our short experience in this work, make us look for a promising future.

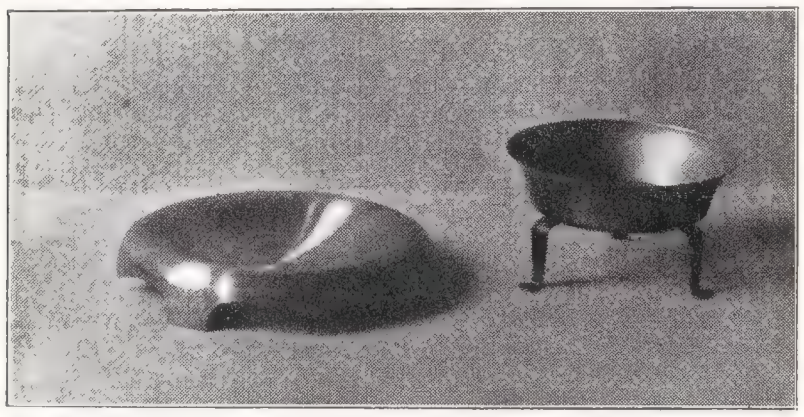


FIG. 8.

For the benefit of those who may use this article to help them in starting metal-spinning the following difficulties are enumerated, with suggestive cautions:

One of the most serious difficulties met with in the manual-training shop, in spinning, is the slipping of the lathe belt. Spinning metal requires more power than turning wood, and a lathe designed for half-

horsepower work is none too heavy for general spinning. The articles shown in the illustrations, Figs. 7–9, with the exception of the smallest pieces, vary in diameter from four to eight inches; they were all spun on an ordinary ten-inch speed lathe. Besides the slipping just spoken of, the metal is liable to slip between the form and center. This may be overcome by increasing the size of center surface as much as possible, and, early in the operation, by getting a fixed contact surface between the metal and its form, as is illustrated in the cup, Fig. 5.

FIG. 9.

In such forms as that of the cup, or any of the articles where the depth is sufficiently great to make more than one form necessary, some "spinning in the air" is required. The beginner will find his metal "buckling, or "crinkling," in this operation, and may usually stop this discouraging trouble by keeping a firmer pressure between the supporting stick and the tool. Sometimes "buckling" is caused by insufficient lubrication of the metal. Soft soap and tallow are good lubricants, but the writer has found petroleum vaseline, such as is used in greasing tools, a very satisfactory substitute.

I believe one other possible difficulty, which usually arises just before the article is completed, should be mentioned here — the difficulty of thinning the metal to such an extent that it will shatter. One must constantly keep the outer portion of the metal compressed by moving the tool toward the axis of revolution, in order that the upper surface of the disk may be kept as thick as the gauge of the metal. It is even necessary to make the metal thicker than this for such forms as the bonbon dishes and pepper shaker, so that when the neck is formed the metal will not crack or completely shatter from being drawn out.

It may be of interest to summarize the different problems which the metal-spinner must solve in making one complete spun article I venture to say that the following outline will suggest an educational value for metal-spinning comparable with the recognized value of some

of the present manual-training subjects. I divide the problems involved in spinning such a form as either of the bonbon dishes in Fig. 7 or 9 as follows :

1. Design of article to be spun.
2. Turning wooden form, or forms.
3. Calculating size of flat disk of metal.
4. Selection of metal.
5. Spinning disk of metal on forms.
6. Annealing metal.
7. Extraction of last wooden form from spun article.
8. Decoration of spun article ; etching, engraving, plating, or coloring by heat or chemicals.

From what has been said it must be evident that one is constantly meeting with difficulties which keep the operator on the alert, and after three years' experience in giving a six-weeks' course in metal-spinning to our second-year boys, we, at Bradley Institute, are just beginning to realize the possibilities in this line of handwork as a manual-training subject.

APPARATUS FOR SIMPLE EXPERIMENTS IN TIMBER PHYSICS.

WILLIAM T. BAWDEN,
Teachers College, New York City.

A PART of the course in "woodworking for the elementary school" at Teachers College is the study of the sources and properties of the woods most commonly met with in manual-training work. The purpose of this study is to enable students to obtain a better knowledge of the physical and economic properties of woods in general and in particular of the species studied. The following list was considered as

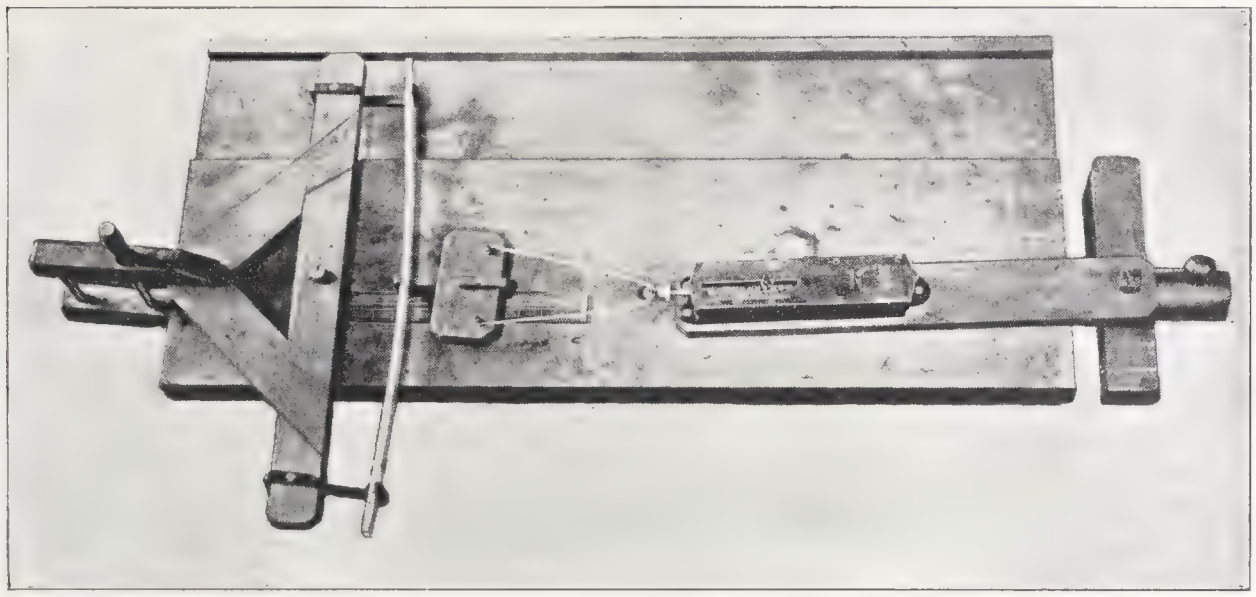


FIG. 1.

comprising the most important varieties, with special reference to the eastern part of the United States: white pine, Georgia pine, North Carolina pine, spruce, cypress, whitewood, basswood, gumwood, white oak, ash, hard maple, black walnut, and mahogany.

For many of the data required resort was had to the Jesup collection in the American Museum of Natural History, to books, photographs, etc. But for the physical characteristics it was desired that the students should gain some knowledge at first hand.

First, to note the sources and general economic properties, each student prepared a tabulated statement for each tree whose wood was to be studied. For this purpose the department had printed cards similar to those used in mounting the Jesup collection referred to

above. The cards are about 6″ × 12″ in size; one-half of one side is blank, intended to be filled in with the desired data, including a sketch of the leaf form; the other half contains an outline map of North America, on which the geographical distribution is to be indicated by a wash of green water color. Strength and hardness are indicated by simply giving the numerical value of each wood in the scale as determined by the results of the tests as described below.

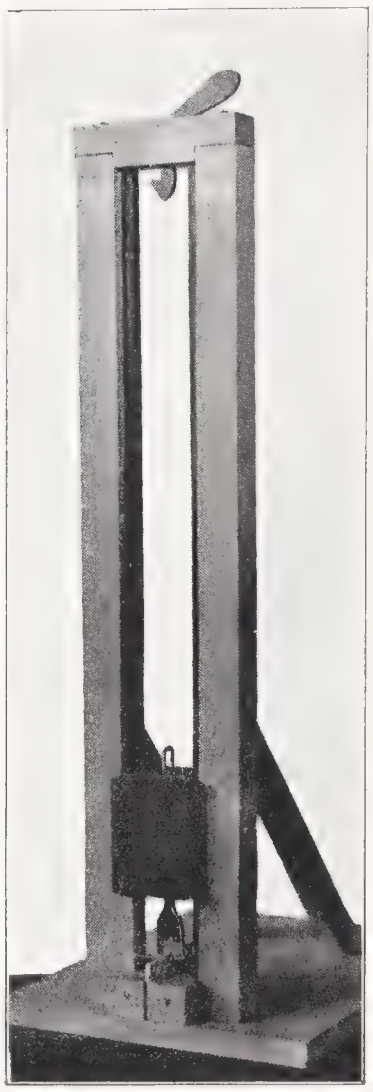


FIG. 2.

Each student was given a sample of each of the different varieties of woods to be studied, ⅜″ × 3″ × 5″. Each piece was faced and reduced to one-quarter inch thickness, the edges squared, and the ends block-planed, thus giving some idea of the actual working properties.

This individual work was supplemented by two series of tests or experiments, performed in the presence of the class, to determine the degree of (1) transverse strength, and elasticity, and (2) hardness.

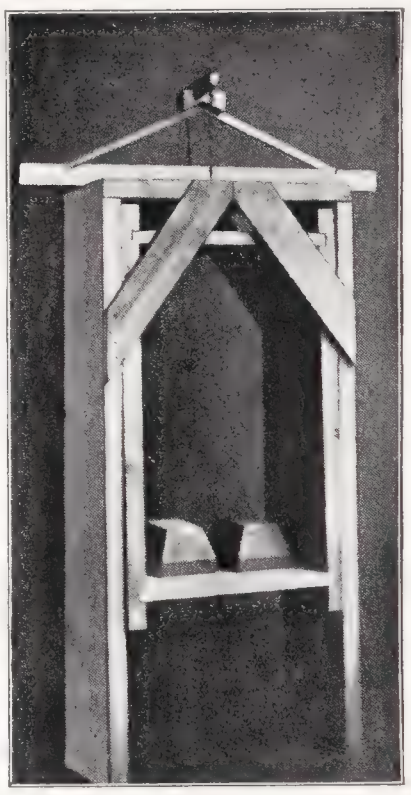


FIG. 3.

1. The apparatus shown in the accompanying cut, Fig. 1 (from a photograph), was designed and constructed for this purpose. It consists of a framework secured to the top of a wood-worker's bench, to which are attached, twenty inches apart from center to center, two forged iron loops intended to engage the extremities of the stick of wood to be tested. This frame is held in position by a bench-stop and a small hand clamp. The stick of wood to be tested is engaged at its center by a third forged loop which is attached to the plunger of a Chatillon self-registering spring balance. The spring balance is screwed down to a strip of wood which, in turn, is attached to the tail vise of the bench by a bench-stop. The opening of the tail vise, then, produces motion in the third loop away from the anchored

frame, thus setting up in the stick of wood a bending strain. The strain is continued until the elastic limit of the stick is reached and it gives way; the amount of pressure required to produce rupture is registered by the spring balance; and the elasticity of the stick, or the amount of yielding before the break, is found by clamping a scale or rule to the bench and following the stick by hand with a small block or indicator.

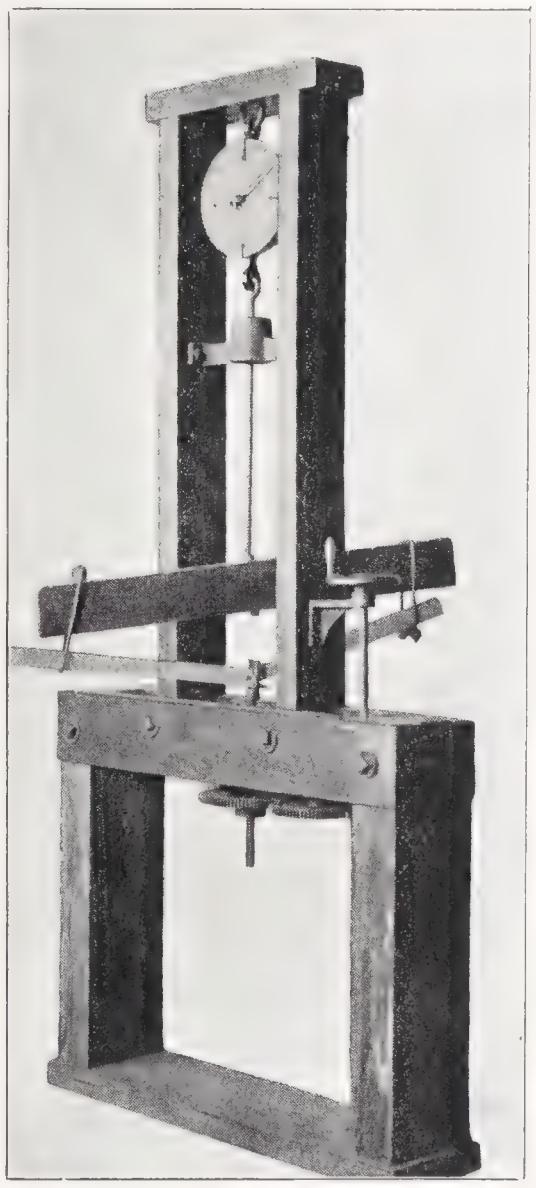


FIG. 4.

Where the iron loops engage the stick of wood the metal is forged in triangular section so that pressure can be applied at a point. The sticks of wood tested were made $\frac{3}{8}'' \times \frac{1}{2}'' \times 24''$; but, as the loops were placed twenty inches from center to center, the results would refer to sticks of that length. Seven pieces of each variety of wood were tested, and the averages taken and arranged in a scale.

The results of such tests, of course, could not be expected to have any scientific or commercial value; but they do have a value in presenting an approximate relative scale of strength and elasticity of the woods actually in use in the shop, of substantial accuracy with reference to the comparatively small members with which manual training construction is concerned.

2. To make the tests for hardness, Mr. Charles H. Bailey designed and constructed a piece of apparatus on the plan of a miniature pile-driver; see Fig. 2. A short chisel is planted in a block of hard maple about $3\frac{1}{2}'' \times 3\frac{1}{2}'' \times 4''$, which is arranged to drop about $20''$; the block slides in ways, and is provided with a trigger release.

The pieces to be tested were $\frac{1}{8}''$ in thickness by $2''$ in width, standing on edge, and supported or backed by blocks on either side to prevent lateral spread. The chisel edge is dropped squarely across the narrow edge of the wood at a right angle to the direction of the fibers. The depth of the indentation or cut is then carefully measured

on a steel scale graduated to sixty-fourths of the inch. Several specimens of each kind of wood were tested and the averages taken and arranged in a scale.

Following is the table of values arrived at as the result of the two series of tests. In a simple scale from 1 to 13, 1 represents the *weakest*, the *least elastic*, and the *softest* wood.

	Strength.	Elasticity.	Hardness.
White pine	4	1	1
Georgia pine	12	4	9
North Carolina pine	8	3	7
Spruce	6	5	4
Cypress	3	8	5
Whitewood	1	6	2
Basswood	5	7	3
Gumwood	9	9	7
White oak	11	13	12
White ash	7	12	10
Hard maple	13	11	11
Black walnut	10	10	8
Mahogany	2	2	6

Fig. 3 represents a very simple machine for breaking small beams, devised and built at the Ethical Culture Schools of New York. In this machine the load is applied by iron weights placed in the pan at the bottom.

Fig. 4 is a somewhat more elaborate testing machine built and used at Pratt Institute for much the same purpose. In this apparatus the load is applied through a train of gears at the base of the machine which engage a slotted screw to which the lower clamp is attached. The rod to which the upper clamps are secured passes through a dash pot that serves to soften the shock at rupture, and is then connected with a Chatillon spring balance registering to two hundred pounds.

AN INDUSTRIAL LIBRARY.[1]

ARTHUR W. RICHARDS.
Ethical Culture School, New York city.

THE matter of hand and constructive work is associated vitally with the whole field of human industry. It is for this reason, in the main, that it is of concern in education. In fact, it came into the school because it was recognized that something of the whole life of man was missing in the activities and interests carried on in school, and that there was dire need of having represented there those human interests and activities with which, more than anything, man's faculties, intelligence, and labors have been concerned. It is this point of view which furnishes grounds for having in the school and within the shop precincts an industrial library.

On the same grounds, the function of such a library would be to serve as an aid in keeping the handwork and constructive activities warm with the motives, sentiment, and intelligence associated with the arts and industries. It would not be difficult, with all there is to the matter of methods and technique, and with what little there is of time, to miss these deeper things which have so much to do with giving the activities of the shop a distinctly human meaning.

The desire not to neglect these larger world-aspects of handwork has led to the gradual collection of some material, in the workshop of the Ethical Culture School, pertaining to the arts, industries and sciences. This we term the "industrial library." This material has been taken from all sorts of magazines and papers, from *Munsey's* up through the list of those dealing with general interests, the scientific publications, general and special, the trade and industrial journals, the catalogues and publications of manufacturing business concerns. And I would make special note of government publications, which are especially valuable.

The material taken from these publications consists of (1) reading matter, (2) pictorial matter, (3) plans and drawings. Under the latter head are some three hundred drawings taken from the Patent Office, which show something of the evolution of various machines and tools of industry.

[1] Read before the School Crafts Club of New York city, January 9, 1903.

The library is organized with a view to bring out several things regarding the arts and industries involved:

1. The life and labor these involve.
2. Their history or evolution.
3. Geographical and racial aspects.
4. Methods and processes.
5. Tools and machines.

The scheme of classification is somewhat as follows:

1. Habitations of man, including architecture and the building arts.
2. Industries concerned with securing natural supplies and materials, as farming, lumbering, mining, fishing.
3. Manufacturing, having to do with working raw materials into useful articles and material.
4. Commerce, the business of distributing, under which comes:
   a) Transportation by land and by water.
   b) Protection of Commerce.
   c) Communication.
5. Engineering arts, springing from the needs of all man's industrial activities.
6. Mechanic arts, the right arm of the engineering arts.
7. Miscellaneous matters:
   a) Measuring, indicating, and testing methods and tools.
   b) Photography.
   c) Optics.
   d) Musical instruments.
   e) Science, discovery, invention.
   f) Biography.
   g) Life and scenes of various lands and peoples.

A few illustrations, perhaps, will best show the uses of an "industrial library" in the school:

1. This week one class was started on a new project. The afternoon before some twenty or thirty pictures showing various types of this project, under various conditions, and illustrating something of the method and labor of construction, were selected from the library. After dealing with the important points which the last project involved, leading up to the substance of the new, these pictures were sent through the class and kept moving some eight minutes, until they had gone around. That eight minutes' observation did more to make that project a live, worth-while matter to every boy, and furnish his mind with material for the imagination to work in expanding the subject, than an hour's talk plus any sentiments of home and class-room that

could be utilized. Further than this, reading matter bearing upon the subject was selected to be placed in the class-room, where it could be seen, borrowed, and taken home.

2. This illustration shows the use of the library to the class teachers, or the school outside of the shop. A teacher, in her history work dealing with the Moors, found material under Moorish and Spanish architecture which furnished considerable matter for the proper imagery of the times and people concerned.

3. A boy comes and asks if I know where he can find something about electric motors—"just simple ones;" and a little talk and a little matter from the library starts a new chapter in his mental life.

In addition to the filed material, there are magazines, such as the *Scientific American*, *Model Engineer*, *World's Work*, etc., which are loaned out to the boys.

It is hardly necessary to make any generalizations from these illustrations. I believe we can depend upon it that in the boy we have to deal with one who is heir to the whole past of man, and that by striking the main chords in the life of man there will be a responsive vibration within the boy.

The industrial library, by throwing a ray of light from the world's real work into the small labors of the boy, sets some important light-waves vibrating.

MANUAL TRAINING IN WISCONSIN.

JOHN HENRY MASON,
Stout Manual Training School, Menomonie, Wis.

IN the October number of this MAGAZINE the editor called attention to the "steady and intelligent introduction of manual training in the Northwest," and mentioned Wisconsin as one of the states in which the movement was particularly noticeable. The purpose of the present article is to review briefly the history of manual training in this state and consider the outlook for it in the future.

Wisconsin has always been well and favorably known for its liberal educational policies and its progressiveness in all efforts to promote the moral and intellectual welfare of its citizens. A state university and agricultural college, seven normal schools, six charitable and reformatory institutions, a score of day schools for the deaf, nearly two hundred and twenty-five high schools, three hundred and twenty-five state graded schools, its five county training schools for teachers, and its two county schools of agriculture and domestic economy, all bear testimony to the fact that Wisconsin's motto, "Forward," was well chosen.

It is, therefore, not surprising to find manual training making its appearance as early as 1856, and in the Wisconsin State School for the Deaf at Delavan. It was not, of course, then known as manual training, nor was it found in the completeness now existing at this institution. Janesville was probably the first to direct attention to the new educational movement when, in 1882, its public schools made an exhibit in manual training at the meeting of the State Teachers' Association. The display attracted much attention at the time and exerted a strong influence favorable to the cause throughout Wisconsin.

In 1883 the Whitewater Normal School started manual training in connection with elementary physics, the object being to make the pupils more resourceful. Five years later Professor A. A. Upham was appointed head of the science department, and by 1891 he had worked out a course in joint-making and published a small handbook embodying his views.

But the first city in Wisconsin to make manual training a regular part of the school curriculum was Eau Claire. In July, 1884, the school

board of that city appropriated the sum of $800 to fit up a few rooms in one of the school buildings, and classes of ten each were given instruction in woodwork and mechanical drawing, the first teacher being a graduate of the St. Louis Manual Training School. Later forging was added; also a wood-turning lathe and a metal-working lathe, both operated by foot power.

The example of Eau Claire was followed in 1891 by Milwaukee and Menomonie, both introducing manual training in the high school as a regular part of the school work. Menomonie, however, is the town best known in Wisconsin for its work along this line, and a glance at the growth of the manual-training idea here may well be given in any consideration of the growth in the state as a whole.

It was in October, 1890, that Senator J. H. Stout made the proposition to the school board to erect a suitable building, equip the same, and pay the running expenses for one year, provided the board would appropriate $500 toward the project. The proposition was accepted, and on January 5, 1891, the new school opened in a two-story wooden structure, 24 feet by 44 feet, in which provision was made for carpentry and mechanical drawing for the boys, and cooking, sewing, and dressmaking for the girls. Three recent graduates of the Toledo Manual Training School were engaged as instructors.

It was not long, however, before the rapidly increasing work necessitated more commodious quarters, and again Mr. Stout gave practical expression to his views on education, by this time erecting a building 60 feet by 137 feet and three stories high. The new school was opened in March, 1893, and in it complete provision was made for giving instruction in manual training to both sexes.

Unfortunately this second building was also constructed of wood, and on February 2, 1897, it, with the adjacent high-school building, was completely destroyed by fire. The opportunity now presented itself either to drop the manual-training project entirely, or else continue it on a much-reduced scale. Neither course was taken. On the contrary, Mr. Stout and the people of Menomonie had become so convinced of the value of manual training that it was decided to rebuild at once and upon even a larger scale than before. The result of this decision is now seen embodied in the two beautiful brick structures, the Stout Manual Training School and the Central School, as they stand in the heart of the city, connected by an ornamental iron bridge of 60 feet in length.

The manual-training work in Menomonie extends through the

grades and four years of the high school. The city also has a complete kindergarten system, buildings and equipment for which were provided by Mr. Stout.

In 1895 the state recognized manual training as a legitimate part of the work of the public schools by enacting what is known as the manual-training law, the securing of which was largely influenced by the exhibit made by the Stout School in that year at the meeting of the State Teachers' Association. The exhibit was shown in the capitol at Madison, where it remained in place during the entire session of the legislature. This law provided for a special state aid of $250 to ten free high schools (four years later the number was increased to twenty) that maintained manual-training departments for at least six months of the year and followed the course for such schools as outlined by the state superintendent. The course prescribed embraces freehand and mechanical drawing, work in wood and iron, cooking, and sewing; but each scheme as presented for approval is considered in relation to the locality for which it is designed.

Regarding manual-training teachers, the state at present deems it unwise to require that they shall pass examinations in literary branches or in mechanical proficiency. Applicants are judged as to their fitness by the training they have received, by their experience, and by giving evidence of intelligent apprehension of the methods, aims, and purposes of manual training.

As far as the writer has been able to ascertain, manual training, either in the high school or the grades or in both, is at present found in the following cities and towns of Wisconsin. The date of introduction, when known, is also indicated:

Janesville, 1882; Eau Claire, 1884; Milwaukee and Menomonie, 1891; Appleton, 1895; Fond du Lac, 1897; Mayville, 1898; West Superior, 1900; Washburn, 1901; Florence, Manitowoc, Marinette, Mazomanie, Mondovi, and Racine.

Looking forward to the introduction of manual training in the near future are Antigo, Bayfield, Beloit, Grand Rapids, Green Bay, La Crosse, Madison, and Omro.

Burlington maintained joinery until 1900, when it was discontinued, the work not meeting with the approval of the department of public instruction.

Oshkosh began in 1898, but a recent fire put a temporary stop to the work. It will be resumed next September, when a new $65,000 building ($100,000 with equipment) will be occupied.

Waupaca had woodwork for a while, closing in 1900.

Eau Claire has plans drawn for a new $20,000 manual-training school that it hopes to erect before very long.

Beloit, last fall, had submitted to popular vote the question of the introduction of manual training, and the "noes" carried the day. It seems that an extra levy would have been necessary and "this extra levy, *not* manual training, was voted down," writes Superintendent Converse. He adds that the project is by no means dead, but will come up again for consideration in a year or two. A few "union" men voted against the measure, thinking trades were to be taught, but as a general thing the unions do not oppose manual training.

The prospects for manual training at Omro are particularly promising. About eighteen years ago Mr. H. W. Webster, of that place, left provision in his will that after all legacies were paid, if sufficient funds remained, a school of domestic arts was to be founded. This fund now amounts to $37,000, and it is proposed to devote it to manual-training purposes, as the supreme court has decided that such would come within the scope of the will. Work on a building will begin as soon as a site can be selected.

Mention has been made of the two county Schools of Agriculture and Domestic Economy. One is located at Wausau, the other at Menomonie, and both were opened in the fall of 1902. They are an entirely new departure in educational work, and are the first and only schools of the kind in the United States. Their aim is to introduce into the school system professional training for the farmer, and they are included in this sketch because manual training enters into their courses. The boys' training includes work in farm blacksmithing, carpentry, and rural architecture. The girls are given instruction in cooking, sewing, and laundering. Both girls and boys take drawing.

In any consideration of manual training in Wisconsin the charitable and reformatory institutions of the state should not be overlooked. At the school for the Deaf at Delavan, drawing, molding, work in both wood and iron, cooking, and sewing are found. At Chippewa Falls, in the Home for Feeble-Minded Children, over two hundred receive instruction in manual training. A completely equipped department, including a sloyd school, is found in operation in the Industrial School for Boys at Waukesha; while domestic science is part of the course for girls in the School for Dependent and Neglected Children located at Sparta.

There is no question but that the interest in the manual-training

movement is general throughout Wisconsin. Certain it is that the demand for teachers is beyond the supply. Indeed, the lack of properly trained teachers presents one of the most serious difficulties in the organization and progress of the work. State Superintendent Harvey has repeatedly called attention to this fact in his reports to the legislature, and recommended that a state school for the preparation of teachers of both manual training and domestic economy be established in connection with one of the normal schools. W. D. Parker, state inspector of high schools, in a communication to the writer says: "If it were possible today to name with a degree of readiness men and women who have undoubted technical qualifications and a fair degree of executive ability to plan and promote organization in the state, the number of schools that would take manual training would be very greatly increased within two years."

Recently the board of normal-school regents has put manual training into all the normals for the grades below the normal department, and the incidental effect of this should not fail to be considered in its influence upon manual-training progress in Wisconsin. The Oshkosh Normal School is the only normal having a distinct manual-training course for training grade teachers in the subject. While the teaching here is based upon the Swedish sloyd, the valuable features found in other systems are freely adopted. Some wood-turning and work in cold iron is offered in the junior and senior years.

Domestic economy is found in both the Stevens Point and the West Superior normals, the former having a special course for those preparing to teach this branch.

The question of preparing manual training teachers for the state has been considered at Menomonie, and it is probable that the time is not far distant when the Stout Manual Training School, with its ample facilities, may undertake the task. It now has several of its graduates in charge of manual training in Wisconsin towns.

The writer is under obligations to officials of the state department of public instruction, and to various city superintendents and principals, for information kindly furnished.

THE MANHATTAN TRADE SCHOOL FOR GIRLS.

MARY SCHENCK WOOLMAN,
Professor of Domestic Art, Teachers College, New York city.

THE Manhattan Trade School for Girls is worthy of special attention because it is essentially a new departure in American education and because it is the result of years of close study of the actual conditions that exist among the working girls of New York city by men and women of the broadest sympathies, the widest experience, and the highest motives. The officers of the governing body of the school are: Miss Virginia Potter, President; Mrs. Theodore Hellman, Mrs. Henry Ollesheimer, Mrs. Hanna Garlin Spencer, Dr. Felix Adler, and John Graham Brooks, vice-presidents; J. G. Phelps Stokes, treasurer; Dr. John L. Elliott, secretary; Miss Louise B. Lockwood, assistant secretary; Miss Susanne R. Miller, executive secretary. We are glad to publish this article from the director of the school, Mrs. Mary Schenck Woolman, who is also professor of domestic art at Teachers College, Columbia University. The school is located at 233 West Fourteenth street, New York city.—[EDITOR.]

A WORK in practical education, greatly needed in the United States, began November 1, 1902, in New York. The aim is to train girls directly for skilled handwork in the trades.

The best sort of an expert trade worker is the one whose physical condition is good, whose brain is trained for use in practical problems, who is a skilful worker, and who loves and understands her trade. To educate workers of this character requires many elements of instruction besides the craft alone. With such a foundation as the beginning of her life-work a girl of intelligence can easily rise to a controlling position in her workroom.

The need for providing such schools has long been felt in New York city. Social workers have realized that the lack of open-minded training for the thousands of girls working in trades is a lack in our preparation for economic and commercial success. They have tried to arouse the city and state to their duty in this matter. Trade is suffering for the need of skilled workers. Women are employed almost exclusively in many trades requiring patience and delicate handling. On account of the lack of adequate training for them, the unskilled parts of the trade are so overcrowed with applicants that wages are small and even decreasing, while the skilled parts run short-handed and have often to rely on trained foreign workers.

European nations are ahead of us in this trade-training. Elaborate systems of state or municipal education provide almost everywhere

for the entrance of girls into industrial life as a profession. In some countries three or four years are given to this training.

In our own country we are at the opening of a very successful industrial era. Industries are being rapidly developed. Manufacturers everywhere complain that they are handicapped in their plans, for they cannot obtain workers upon whose judgment they can rely—who can take the lead in their workrooms.

A large proportion of the girls educated in our public schools enter into some trade as soon as the compulsory school years are over. At fourteen years of age they crowd as unskilled workers into some factory, workroom, or store. Their parents cannot afford to have them non-supporting. The problem of living is too vital. The girls are generally bright and ambitious, but they are not fitted for any special field. They take the first position which offers, usually answering some newspaper advertisement. The work is often uncongenial, but there is small prospect of change to anything else, as the old grind gives its steady wage.

In the rush and hurry of the shop it is no easy matter to learn a trade. The old apprenticeship system has passed, and nothing satisfactory has taken its place. The young worker watches the others and laboriously learns one part of the trade. It often takes years to become expert in work which might be learned easily in one-quarter

of the time if the instruction were regular and adequate. Even bright girls become discouraged and will refuse to try new work if it is offered to them; so deadening is the effect of the need of money and the fact that anything new, temporarily at least, decreases the income.

The Manhattan Trade School offers help to these young workers. The movement is the result of many months of careful investigation and discussion by a number of prominent philanthropic, sociological, and educational workers who have long been deeply interested in the subject and who know well the conditions under which working girls live, the needs of the trade, and questions of practical social betterment. During more than a year they have given conscientious study to the problems involved. The opinions of employers, workers, and organized labor were asked. The pressing need for such a work made them urge immediate action. Training in certain trades where the need for skilled labor was very great was begun at the school, and other trades will later receive attention. The board of management is composed of these same workers. The school is an independent movement. It is not connected with the municipality nor with any society.

An old-fashioned New York residence at 233 West Fourteenth street was fitted up very simply like the usual trade workrooms of the better class. There are foot and power machines; tables for brush, millinery, and dressmaking trades; easels for drawing, etc. All necessary equipment for conducting the various trades connected with the needle, the paste brush, and the operating machine are provided. An assembly room, used also as a gymnasium, is on the first floor, and a kitchen and lunch-room are in the basement.

The day work is for inexpert workers. The hours are from nine to five daily except Saturday and Sunday. The students are from fourteen to sixteen years of age. Trade instruction occupies more than half of each day. Practical academic work and drawing receive attention daily. The first includes rapid reckoning, making out of bills, keeping accounts, writing business letters, the use of good

English, the history and development of trade, the effect of different trades on the city, country, etc. The drawing and color work are closely adapted to trade needs and are directly applied to improve articles made in the school and to judge those on the market. Each student has also daily exercise in the gymnasium. Courses of skilled handwork of several years' duration will be given if there is a demand for them.

Night classes are also in operation. These are for self-supporting women over eighteen years of age who wish to advance in their trade more rapidly than is possible without instruction.

So rapidly did the school prove its usefulness that before two months were over it was crowded to its full capacity and had a large waiting list. The school desires to reach the poorest girls whose weekly wage is so necessary to themselves and families that even free instruction is impossible to them. In order that they shall not be deprived of this necessary income, and shall be able to take this needed instruction, a scholarship amounting to about one hundred dollars a year has been provided for such girls. The instruction in the day classes is free; a small fee is charged for the night classes.

Such schools as this should be in connection with the public-school system in all parts of the United States where industrial conditions prevail. It is an evil for girls from eleven to fifteen to enter untrained and unprotected into trade work. The reaction is felt in the homes, in public morals, and in the business world. It is almost impossible under the usual factory conditions for unskilled girls to rise quickly to fair wages.

The Manhattan Trade School, as one of the first schools to face, study, and act upon these problems, desires the interest and co-operation of the community.

ASSOCIATIONS.

THE SCHOOL CRAFTS CLUB.

THE third stated meeting of the School Crafts Club of New York was held at Hotel St. Andrews, March 13, 1903, Dr. James P. Haney presiding. After a short business session, during which four new members were elected, Mr. W. S. Goodnough, of the program committee, took the chair and the meeting was opened for the exhibition of work and discussion. A number of interesting specimens of metal work, such as candlesticks, trays, etc., made of sheet metal and copper wire were exhibited by Professor Richards, of Teachers College.

Mr. Arthur L. Williston, of Pratt Institute, spoke of

MODERN TENDENCIES IN MANUAL TRAINING IN PUBLIC SCHOOLS.

There were different tendencies, but underlying all the speaker traced a movement to provide more ways of bringing the student's thought and feeling into the work. At first the Russian system was the only one. This consisted of geometrical exercises. The technical student might put something of himself into the work, but it did not appeal to the interest of all. The next to engage popular attention was sloyd, with its completed models, related to the home and appealing to the pupils' feelings. A few years after the appearance of sloyd the American system developed, combining the features of the other two. Following these three distinct methods came another movement which laid more stress upon the appreciation of form, giving opportunities for freer expression. Through all these movements it appeared that we were adding year by year some new thought to what we already had rather than substituting one thing for another. This Mr. Williston regarded as the first tendency.

The second tendency was the growth of a more intimate correlation between mechanical work and art. As an example of this a paddle was shown, the subtle curves exercising the æsthetic sense, while the execution demanded considerable mechanical skill. There was also a tendency to extend the correlation of handwork with physics by the making of physical apparatus, etc. A more effective correlation was afforded where the pupils had to learn the principles in another department before working out their models in the workshop. The fourth tendency was the bringing of the human side of the work to the front. Technique is becoming of relatively less importance. The question of how to get a living is being included in the larger question of how to attain the fullest life.

The speaker here made the point that if manual training is given for its educational value — for the opportunity it offers for self-expression — then it is equally necessary for boys and girls. Manual training affords opportunity for the child to express himself under wise guidance. It is of more importance that he should express *ideals* than *ideas*. A child makes a model. It is his own idea, but does not represent his ideal of what he would *like* to make. Would it not be wiser for him to attempt to work out something designed by a master hand, which would express his ideal and therefore be a truer expression of himself?

Mr. L. W. Wahlstrom spoke of correlating manual training with other school work and with the industrial life of the community. Models of a canal lock and the Gutenberg press were exhibited as relating respectively to current and mediæval history. These were made by boys working in groups. In connection with the study of the press the class teacher took up the study of means of communication. The press was put to practical use in the printing of programs, etc., for the school, and the boys were taken to visit a newspaper office. An unusual interest in mediæval history was aroused by making catapults, battering rams, etc. Arches were constructed in connection with the study of cathedrals.

Mr. Wahlstrom gave an interesting account of the results of manual training in a school in Indianapolis. Evening classes were opened for colored men and boys. The work consisted chiefly of articles for household use. The students showed great interest and made satisfactory progress, the result being a noticeable advance in self-respect and a new ambition to improve their home surroundings and social life.

Mr. W. H. Noyes, speaking of the tendencies of manual training, said our schools should be a reflection of life outside. A great change is going on in the world's industrial and social life due to the introduction of modern machinery and modern methods of work. What was normal life in days past is not normal life today. Our schools generally fail to give children any adequate knowledge of the real conditions of life in the world in which they must play their part. To develop a better appreciation of the momentous changes which are going on is the great opportunity of the manual-training teacher.

Referring to Mr. Williston's remarks concerning the necessity of manual training for girls, Dr. Haney took the ground that the same kind of work is not suitable for both sexes. The question must be discussed from the physiological standpoint. The development of the girl is different from that of the boy, and different opportunities and instruction must be given accordingly. Granting the reasonableness of the physiological argument, the question would arise: Will that which is sauce for the goose be sauce for the gander? Both boys and girls should have manual training, but the specific means employed should be different.

Mr. Williston explained that he had not meant to insist that both boys and girls should be given exactly the same training, but he wished to point out the fallacy of the old argument that the work should differ because boys would enter one kind of trade and girls another.

The next topic on the program was

METAL WORK IN THE ELEMENTARY SCHOOL,

discussed by Mr. W. E. Stimpson, who exhibited a variety of articles of wire and sheet metal. In teaching Venetian iron work the scroll should be introduced first as being the simplest form to make. Angle bends demand greater care and more thought; these should be taken up later. After this twisting might be taught. A candlestick was shown as an illustration of the work described. Parts were fastened together by punching and riveting. An example of sheet-metal work was shown in the form of a match box of very attractive design. Feet were riveted on and ornamental hinges and escutcheon attached. Such a model could be made by young pupils with little difficulty. The stock should be furnished cut to dimensions. Several small trays were shown having ornamental designs etched on the metal. These were modeled with a hammer on a block of wood. Mr. Stimpson would advise the

use of type forms to be modified by the pupils. This form of manual training was recommended as being easily handled with a very small equipment of tools.

The subject of

MECHANICAL DRAWING IN HIGH SCHOOLS

was presented by Mr. Arthur H. Flint. Numerous examples of pupils' work were exhibited. Mr. Flint believed that mechanical drawing was valuable in imparting habits of accuracy and neatness, and cultivating the imagination and reasoning powers. The work should be begun with problems in projection, first of a simple character and later with objects not parallel to planes. Boys are found to be much interested in this line of work. Freehand work should always be brought in at intervals, and lettering carefully taught. Pupils should have simple machinery placed before them from which drawings should be made, beginning with freehand sketches. House-planning was recommended as giving exercise to the inventive faculty in addition to skill in drawing, while it also appeals to the interest of the pupils. Much has been said about art and free expression. Mr. Flint thought it was wise sometimes to limit the child in freedom of expression. Mechanical drawing, which demands accuracy and careful representation, contributes much to mental development. A boy does not know his bicycle until he has taken it apart and put it on paper.

Mr. Harold Brown questioned the wisdom of spending so much time in the careful inking of mechanical drawings. He thought the introduction of some problems in design in correlation with the mechanical work would be better than a cut and-dried course in the latter.

Mr. Stimpson recognized the value of inking in drawings as counteracting the tendency to careless and slovenly habits. It is good for a boy to make a finished piece of work. Other speakers took the same ground.

Mr. A. H. Chamberlain held that, while a knowledge of projection was necessary, there was a danger in carrying mechanical drawing too far. In many English schools where great emphasis was placed upon this work the artistic spirit was lacking. Too much of it may kill out the appreciation of art. The notion that the special ability gained in mechanical drawing — as, for instance, accuracy — may be carried over into other lines of work is open to question.

Mr. Tilden defended mechanical drawing. The work is not given to make pupils architects or draftsmen, but to develop their faculties. The accuracy gained here must be helpful in other lines, and it is a kind of training which is not to be had in any other line of work.

Referring to the value of mechanical drawing, Dr. Haney pointed out four phases of the subject, each having a distinct educational value. First, projection; this he considered good training, developing the power of clear thinking. Second, planning, which aids the appreciation of relations of magnitude. Third, constructive design, training the perception of proportion and symmetry. Fourth, the mechanics of the work. Some of this is very desirable as training in skill, but after muscular co-ordination has been attained all further work in the same lines become useless.

There should be some way of co-ordinating these different elements with the life the child is living. The temper of the times favors the use of processes which lend themselves to such co-ordination. The only criticism the speaker would offer on inked-in work would be as to the amount given.

The fourth stated meeting of the School Crafts Club was held May 8. Amend-

ments to the constitution and by-laws were passed causing the fiscal year of the club to coincide with the school year. Four candidates were elected to membership. Officers for the ensuing year were elected as follows: president, Charles R. Richards; vice-president, James Hall; secretary, George F. Stahl; treasurer, Walter M. Mohr.

HOME WORK.

A number of specimens of home work were exhibited by instructors from the city public schools. Mr. Steinert showed a miniature automobile of elaborate construction made with a jack-knife. Messrs. Peyser and Stahl had lamp shades and other work in thin metal. Designs were worked in the shades by punching with brads or scratch awls. Trays were made by hammering copper over a wooden block with a tack hammer. Mr. Peyser also exhibited primitive looms and woven articles made by the boys. Some colored drawings for bookracks were shown by Mr. Griswold, whose school is in a down-town district, inhabited chiefly by foreigners. Mr. Vroom contributed a derrick, an apparatus for illustrating the law of centrifugal force, another for reflecting a ray of sunlight into a dark room, besides a number of drawings illustrating mechanical powers, etc.; and several smaller articles in wood and Venetian ironwork. These were all made by the boys at home.

Mr. Mohr spoke of three distinct phases in the work of the city schools — first, the correlation of the work done in the workshop with that done in the class-room; second, home work, examples of which had just been shown; third, communal exercises — the making of things for use in the school by the pupils in groups. Much interest was aroused by a series of photographs of clay work exhibited by Mr. Boone, of Montclair, N. J. These included models of houses, churches, etc., made by boys from nine to eleven years of age, and were hardened and glazed in a kiln. Much experimenting had resulted in the construction of a kiln of fire brick which gave satisfactory results.

A paper on "A High-School Course in Drawing" was presented by Mr. Harold Brown, who expressed a strong disapproval of the tendency to make drawing mere representation. The true purpose of such a course should be to stimulate the ability to perceive beauty. Manual dexterity will come incidentally. The enlarging of pictures and designs by squaring up was recommended. Designs could be modified by changing squares to rhombic divisions. Sketching plant life in tones of gray should be taught early in the course. Pupils should understand the principles of balance and rhythm. Drawings illustrating these principles were shown. Work in representation, constructive design, and decoration should be correlated. To develop a cone for the purpose of cutting out a lamp shade is much better than to go through the operation mechanically with nothing in view beyond the drawing. The spectrum should be introduced early in the course. The study of animal forms should be brought in later. Orthographic projection and architectural work should be taken up toward the end of the course. The attention of pupils should be drawn to principles rather than to details. In the matter of lettering Mr. Brown recommended simplicity. This subject has been too much neglected. The speaker had found it a good plan to distribute small letters to a class and let each boy enlarge one to six or eight inches in height. There has been little improvement on the Roman alphabet, which has stood the test of centuries.

In discussing this paper Mr. Shinn held that the use of representative drawing

was to enable the student to see clearly. In order to be effective the work should be related to the home life. That which is drawn well must be seen well, and not until we see a thing well can we do it well. Pupils should be trained in the power to draw objects without the model. Boys think out problems more readily than girls. Therefore give the girls problems tending to develop thought, while the boys are developed more along the lines of execution.

Mr. Flint insisted upon the value of projection. If left till the end of the course it becomes of little use in the school.

The second paper of the evening was presented by Mr. Arthur H. Chamberlain, the topic being

CONSTRUCTIVE WORK IN THE ELEMENTARY GRADES.

Three principles were submitted by which the work under consideration might be tested. First, it should serve as a medium of natural expression in thought and action. In the traditional schools we have had thought without action, while in these days there is too often action without thought. The mere love of doing might have sufficient weight with very young pupils, but the additional motive of thought and reason must be added for the more advanced. Secondly, constructive work should aim to put the individual into possession of himself, should constantly touch his interests and help to keep him a normal individual. Dr. Dewey says: "The aim of education is to reconstruct experience." Elementary constructive work tends to reconstruct experience, and thereby puts the child in possession of himself. To give the pupil work which interests him is not necessarily to allow him to do exactly what he pleases, and will not therefore tend to the weakening of purpose and character. Thirdly, it should assist the pupils to interpret the facts and forces which go to make up their environment. The work must be such as to place the child in touch with the life that is being lived today and with the society of which he is a part. To this end he should work in various materials and learn something of various industries, the need for such diversity increasing as he advances in the grades.

Mr. Harold Peyser regarded constructive work in its earliest stages as a merely physical exercise. Later the child is actuated by the desire to do something. The boy reads papers and books, and sees things which have been designed, thought out, and made. Constructive work will enable him to understand how this is done. It does not matter much what material is used so long as it shows a process.

Mr. Stimpson would have manual training related to the home life and environment of the boy. Work which would be appropriate in one locality might be less appropriate in another. The commercial idea should not be entirely eliminated.

Professor Richards agreed with Mr. Stimpson as to the commercial aspect of manual training. At a late meeting of school men where manual or industrial training seemed to be the dominant topic one delegate had scored a point when he put the question to a speaker: "Is there any reason why the elements of an industry should not be a part of industrial training?"

A paper on "The Teaching of Color" was presented by Mr. Frank H. Collins. Color work, the speaker said, is not a matter of rules. The artist must have a natural feeling for color. Pupils should be taught to observe color and then taught to use it. The most essential thing in learning to appreciate color is to study nature and the works of good artists. The principles of light, shade, and shadow should then be taught, and the pupil should be led to acquire a habit of right form. The three

points of greatest importance were, first, to realize that nature is the source; second, the training of the power to observe; third, to understand the phenomena of color contrast.

W. F. VROOM.

NORTHERN CALIFORNIA MANUAL TRAINING AND DRAWING ASSOCIATION.

THE Northern California Manual Training and Drawing Association held a most interesting meeting April 25 in the State Normal School at San José. Professor A. B. Clarke, of Stanford, presided, assisted by Miss C. Vivian, Secretary. "The Aim of Manual Training" was the subject of several papers, each writer treating the subject from a different standpoint. Mr. A. D. Meeker made a plea for manual training that is in close touch with life-work. Mr. M. J. Doyle, supervisor of manual training in San Francisco, said that manual training is not joint-making alone. It does not stop at precise mechanical ability; but it is comprehensive enough to include elegance as well as precision.

Mr. M. A. Felton, instructor of manual training in San Francisco, presented his paper from the psychological standpoint. Everyone seeks to establish theories by reverting to psychology. Manual training has withstood the terrible cross-fire of the psychologists and has been justified by them. Manual training is not intended to train mechanics; it is a means of physical and mental development.

Mr. Tenney of Oakland spoke of the educational and utilitarian value of manual training. In reply to the criticism that it is not the business of the state to teach people to make a living he said that state universities all over our country were turning out lawyers, doctors, and engineers. Shall the state aid those who labor with their hands or shall they go to their work unprepared? The education of public schools in the estimation of the speaker is too much above the calling of the average student.

Manual training should be in every grade. In the high school it should be men's work. High-school work should not be too "finicky." It ought to be practical — be in touch with manufactories. High-school graduates should have had practical training of market value.

Mr. O. Haskel, of San Rafael, thought that manual training should use its opportunity to present the ideal workroom — one that is orderly and clean — and that we should be more careful about conduct in the schoolroom.

Mr. Charles H. Thorpe read the last paper on this subject and said that in the grades of the elementary school manual training should help fit the boys or girls for more complete living. It should train their hands to act in harmony with their minds and enable them to become actual participators in this great industrial age. They should, at least, have a better appreciation of what is done by others.

CHARLES H. THORPE.

CHICAGO SLOYD SCHOOL ASSOCIATION.

A MEETING of the Chicago Sloyd School Association was held April 18, 1903, in the rooms of the Chicago Sloyd School, Lees Building, Chicago. Reports of work in the city, and from sloyd teachers in various parts of the country, formed the program of the afternoon, and illustrated the adaptability of sloyd principles to many different conditions.

Miss E. E. Langley of the School of Education of the University of Chicago, reported the work of that school. Manual training is used to illustrate objectively the school program, of which a study of the development of the industries of man forms the foundation. First-grade children are making playhouses. An older group is constructing a chicken house, which is to take its place in the community life of the school. Other groups are making freight cars and boats, illustrating the study of transportation.

Miss Elizabeth Jones of the Laboratory School of the University of Chicago, spoke of her work at the University Settlement. Here she holds evening classes and their number is limited only by the teacher's time. The articles made in these classes are usually such as are of use in the daily life of the maker; household needs are often supplied through these settlement sloyd clubs. Such articles as breadboards, brackets, and clothesline winders are numerous. One snowy winter sleds held the attention of the boys.

A report of sloyd for the blind, from Miss Anna Lagergren, of the State Institution at Jacksonville, Ill., was read. Miss Lagergren's experience shows sloyd to be of even more value to the blind than to the seeing child. Blind children are shut off from the ordinary occupations of childhood, and so do not discover the use of their hands. Sloyd helps them to realize that through these natural instruments they have power over external things.

Miss Mary Eaton reported the work at the Illinois State Institution for the Deaf. Sloyd is a well-established department of this old institution. Boys from nine to fourteen years of age receive a two-years' course and then go into the cabinet shop for more advanced woodwork.

Bench-work at the State Institution for the Feeble Minded at Glenwood, Ia., was reported by Miss Ethel Mills. She showed that this class of children cannot be reached psychologically. The teacher must depend on physiological methods entirely. Perfect work is impossible and no class work can be done. The definite use of the body offered by woodwork helps to keep these children from almost inevitable degeneracy.

Miss Anna Stewart sent a report from the Indian School at Carlisle, Pa. Here Indian children from many tribes are gathered. Both boys and girls receive instruction in sloyd. Their inherited traits, "skill of finger, patience in execution, and keenness of eye," give them an advantage over our children in all kinds of constructive work. In drawing they excel, in nature work and design, and many show great fineness of feeling and appreciation of beauty of form, though their rendering of it is often mechanical in execution. Their interest in woodwork is sincere, for they frequently spend their playtime in making articles needed by their teachers.

Sloyd has been quick in finding its way to our new possessions, and Miss Jennie Ericson of the Industrial School in San Juan, Porto Rico, reports its three years' progress in that island. The youth of Porto Rico are not lacking in manual ability. In drawing they are proficient, especially the boys. Education among the girls has been neglected, and they are slow in grasping ideas. "Deceit and dishonesty are two strong features of the Porto Rican character, and as such things are very readily detected in sloyd work, sloyd is most helpful in bringing out better thoughts and ideas of honor." Miss Ericson says: "Physical labor is still looked upon as a degrading thing here, where only thirty years ago slavery existed, yet in three years I can see a marked change in the matter, and gradually the American influence, with sloyd as

one of its strong helpers, will eradicate the erroneous idea that labor is meant for servants only."

EMILY M. PRYOR.

BOSTON MANUAL TRAINING CLUB.

THE club held its annual dinner at the Copley Square Hotel, on the evening of January 3. Twenty-two persons sat down to an enjoyable repast. The invited guests were Professor Robert H. Richards of the Massachusetts Institute of Technology, Mr. Gustaf Larsson, Mr. F. M. Leavitt, Mr. C. W. Parmenter, Mr. F. A. Tupper, head-master of the Brighton High School, and Mr. John M. Woods, a prominent lumber dealer. The social committee—Mr. Alexander Miller, chairman - completed the evening by presenting each one present with a pencil in the form of either a wood-screw or a nail.

On January 10 occured the regular monthly meeting. The new members admitted were W. H. Ashton, Rockford, Ill., E. W. Tuttle, Somerville, Mass., and E. A. Finch, Burton A. Adams, and Frank P. Lane, of Springfield, Mass. Mr. Frank M. Leavitt, principal of manual training schools in Boston, spoke on cardboard construction. He said in part: "Cardboard work was first introduced into the Prince School by Mr. J. H. Trybom, just back from a summer in Gothenburg, where he had studied the subject. The next year four schoolmasters asked for its introduction. Now there are two hundred and fifty teachers doing this work. Unfortunately, where there are no girls in a school, one teacher is called upon to care for a class of fifty to fifty-six pupils. The material is adaptable, can be handled in large classes, and can be used by the regular teacher in the short periods usual to the lower grades. Two one-hour periods are the rule, rather than one two-hour period. The work is a good preparation for woodwork. Applied geometry can be introduced.

"Three years' work is laid out. Mr. Trybom's book is the basis for two years' work. In the first-year work the forms are drawn directly on the cardboard, the teacher drawing on the blackboard while the pupils are drawing. The second year, pupils make working drawings and then work from them. In the third year we insist that the child make a drawing from the model without blackboard assistance. One special feature of this year is the inventive work. This touches the present industrial life. If it is handled by the right person, it is really better than woodwork."

Mr. Gustaf Larsson, of the Sloyd Training School, spoke as follows: "I am very much interested in the question of manual training in high schools. I do not think we should specialize in high schools. A high-school principal told me that, with the right teacher and methods, he could prepare boys for college in about half the time if he gave that other half to manual training. I believe it was Horace Mann who said: 'Give one-half of the school time to creating a desire to learn and you will teach more than by devoting all to books.' The aim of sloyd, or educational manual training, in high schools should be to give the utmost general power—physical, mental, and moral —through the acquisition of general manual skill. In pursuance of this aim, it is necessary that: (1) The teacher should appreciate principles, and make use of them. (2) Work calling for vigorous movements should be a prominent feature. (3) Individual aptness must be provided for; therefore the number of pupils to a teacher should be limited. (4) Exercises should be objects, the use of which can be understood by the worker. (5) The material results should be the worker's own effort, to the practical exclusion of labor-saving machinery. There should be a rational pro-

gression and variety of models, tools, and exercises. (6) Construction should be according to mechanical principles, and tools should be used in a workmanlike manner unless that be physically harmful. (7) Pieces should be simple, of good form, hence artistic. The simple furniture now seen in windows might be a hint to high-school teachers. A worker should use head and heart as well as hand."

Mr. F. O. Smith, of the manual training department of the Malden High School, said: "I think it is right in high-school classes occasionally to teach a principle by means of an exercise rather than by a finished model. This I would not do with a boy of grammar-school age. In second-year woodwork, turning, I begin with four or five abstract exercises (these can be made most interesting), and by doing so more ground can be covered than in project work. I have tried both methods."

At the meeting on February 7 there were admitted to the club Messrs. Andrew Bjurman, of the State Industrial Reformatory, Huntingdon, Pa.; F. H. Dame, Tonawanda, N. Y., and Karl G. Johanson, State Reformatory, Concord, Mass. Mr. Henry T. Bailey, state agent for industrial drawing, delivered a fine lecture.

ART EDUCATION AND MANUAL TRAINING.

At the March meeting Mr. James F. Hopkins, director of drawing, Boston Public Schools, addressed the club. He said in part: "Art education and manual training are two parallel subjects in the curriculum introduced in the order named in response to public opinion. There is an attempt now being made in Boston to bring about a closer relationship in the exercises common to these two subjects. There is also a national movement to carry the exercises of manual training beyond the mere doing, to find opportunity for the expression of creative ideas; and there is an attempt to bring the design of the drawing room into the executed project of the manual-training laboratory.

"There is a point in the union of manual training and art education where some little friction may be developed, but from this lack of easy adjustment must come great good. I refer to the lack, on the part of drawing teachers, of knowledge of the practice of manual-training teachers. This is as broad as it is long. There are few experts in manual training who have broad training in the arts of design and composition. Manual-training teachers should look to the drawing teachers for help in design. Drawing teachers should go to the manual-training teachers for knowledge of tool-craft and working materials. I will outline broadly where it would seem that attempts might be made to unite art and manual-training interests. (1) Bring the weaving spirit out of the kindergarten and carry it forward in paper and textiles into the primary school. (2) Use basketry through Grades III, IV, and V. (3) Introduce cardboard into Grades IV and V. (4) Make the customary use of woodworking in Grades VI, VII, VIII, and IX. (5) Clay-modeling can be advantageously used through all the grades from the kindergarten up and should certainly have a place in the four upper grades. (6) Bent iron should come in during Grades VII and VIII. (7) The simple working of sheet-metal might come in Grade IX. (8) Woodcarving should be more carefully planned in a decorative way. I would like to urge more attention to modeling. Its use has probably been slight on account of the care and preparation which clay demands. Modeling-wax or plasterline, while more expensive, is a satisfactory medium and capable of the best results."

JOHN C. BRODHEAD.

BREVITIES.

HARVARD UNIVERSITY offers four courses in shopwork this summer: chipping, filing, and fitting; blacksmithing; pattern-making and foundry practice; and machine-shop practice.

THE UNIVERSITY OF GEORGIA, at Athens, is to give a course in elementary manual training this summer. Mrs. Ida Hood Clark, of Nashville, Tenn., has been engaged as teacher. Mrs. Clark will give a similar course to the teachers of Biltmore and Asheville, N. C.

J. H. TRYBOM, supervisor of manual training in Detroit, Mich., will spend his summer in Europe. As Mr. Trybom gives special attention to our foreign reviews, all readers of the MAGAZINE may expect to reap some benefit from his trip.

THE UNIVERSITY OF CHICAGO now offers a course in "Social Occupations in Elementary Education" in its correspondence-study department. This course is given by Dr. Katharine E. Dopp, author of *The Place of Industries in Elementary Education*.

AFTER August 8, Miss Althea Harmer, of the Laboratory School of the University of Chicago, will conduct a special class in basket-making and textiles in connection with Mr. Dow's summer school of art at Ipswich, Mass.

ELIZABETH SANBORN KNAPP, of Yonkers, N. Y., is a member of the state staff of instructors for normal institutes in Colorado, and in August will have charge of primary methods and elementary manual training at the normal institute to be held at Pueblo. Last summer Mrs. Knapp gave a similar course at Colorado Springs.

AT the tenth annual meeting of the Western Drawing Teachers' Association held in Springfield, Ill, April 14–17, Miss M. Emma Roberts, of Minneapolis, was elected president, and Miss Eunice S. Bannister, of Peoria, Ill., chairman of the executive committee. A committee which had been appointed to consider a closer affiliation with teachers of manual training read a report containing the following recommendations, which were adopted:

"*a*) That notice be hereby given that after the 1904 meeting the Western Drawing Teachers' Association be known as the Western Drawing and Manual Training Teachers' Association.

"*b*) That upon the committee to revise the constitution the president name one person to represent the manual-training idea and two persons to represent the art idea.

"*c*) That the teachers of manual training receive recognition in the appointment of the executive and program committees for the 1904 meeting.

"*d*) That a copy of the report of this committee, together with the announcement of the place of meeting for 1904, the officers of the association, and a statement of the increased membership dues be printed and sent to members of this association and to teachers of manual training in the western territory, together with a cordial invitation to the latter to co-operate with the 1904 meeting by attendance, exhibitions, and participation in the discussion and deliberations of this association."

MASSACHUSETTS.

A NEW room is to be equipped in the Belcher School, East Milton, for manual training in that district. An additional teacher is to be engaged.

BOSTON.

A RECENT circular letter from the superintendent to the masters of schools throughout the city requests that some form of manual training be used two hours per week through Grades IV to IX. In Grades IV, V, and VI cardboard work, or some other accepted form of work, is advised, and the usual woodwork in Grades VII, VIII, and IX.—JOHN C. BRODHEAD.

NEW YORK CITY.

THE EXPERIMENTAL SCHOOL of Teachers College, which has received the name of the "Speyer School" in honor of the donors, Mr. and Mrs. James Speyer, was dedicated April 23, 1903. President Butler of Columbia University presided at the exercises. Addresses were given by Dean Russell of Teachers College, Mr. Stephen H. Olin, Superintendent William H. Maxwell, and Mr. Speyer. Hon. Carl Schurz had been scheduled to speak, but was absent through illness.

President Butler in his introductory remarks predicted that the Speyer School would occupy an important position among the schools of the country. It should be a leader in educational thought and method.

Dean Russell explained the purpose of the school. It was designed to advance the cause of education through its usefulness as an experimental station and to elevate the community in which it was planted. Library, gymnasium, laboratories, and assembly rooms were to be at all times open for the benefit of the people. It was to be a school for experiment in many lines of usefulness in the neighborhood as well as in school curricula and methods of teaching.

Mr. Stephen H. Olin, president of the University Settlement Society, spoke of the aims and work of that association, which had been successful beyond the hopes of the promoters. The Speyer School had a similar task to perform. It was built to solve questions of general education and good citizenship.

Superintendent Maxwell said the building of this school marked a turning-point in the stream of wealth which had, of late years, been flowing so freely into educational channels. Heretofore money had been given to colleges and universities for the education of older people; here it had been spent for the benefit of the children. The public schools needed someone to experiment for them, and the Speyer School was admirably adapted for that purpose. It should solve the problems of providing manual training, moral instruction, and the proper connection between school and home.

Mr. Speyer, who was greeted with enthusiastic applause, spoke briefly of the influence the school should have in the community. The building, he said, is but a small thing. It is the work of the teacher which tells. Citizens must be intelligent as well as law-abiding. In peace and in war, and in the solution of industrial questions, American schools will show their influence.

At the opening and closing of the ceremonies excellent music was furnished by an amateur orchestra organized by Columbia students.—W. F. VROOM.

THE annual exhibition of the Ethical Culture School of this city was held at the school building, 109 West Fifty-fourth street, April second, third, and fourth.

The work of normal students and children of the kindergarten department was displayed in the kindergarten room. Besides their training in kindergarten occupations, etc., the students of this department take courses in manual training (including wood joinery) and domestic art. The articles exhibited represented a broad variety

of processes and showed excellent workmanship, particularly the basketry exhibit. A line of "mission furniture" in miniature appeared to be the principal departure from the ordinary lines of work. The chairs, tables, etc., were formed of round pieces of wood cut to the required lengths and nailed together.

In the work of the primary grades were models in clay, cardboard, paper, iron, wood, and other materials. An Esquimau village indicated the correlation between the manual work and the reading of the children. Small chairs, made in the third grade were formed of strips of wood about 2x½ inches in cross-section nailed together. The processes of molding candles and quilting were shown, also a potter's wheel, on which the children made articles of clay. The evolution of lighting was illustrated by a series of models made by the children. Other work was exhibited in considerable variety, conforming more or less closely to the ordinary lines of manual training.

In the grammar grades, as indeed in a great measure in all grades, the work was designed to give the pupils an intelligent idea of the industrial processes carried on in real life. There were water-wheels, lathes, looms, spinning wheels, boat frames, windmills, trussed bridges, etc. One of the water-wheels was connected by rubber hose with a water faucet and belted to a sewing machine, which was set in motion by the power thus applied.

Manual training in the high school is at present elective. It is the intention of the management, however, to have a fully organized course in this department when work is begun in the new building, where there will be a well-equipped workshop. Some high-school models were exhibited, generally similar in character to those of the grammar grades.

An interesting feature of the exhibition was a room devoted to the work of graduates of the school. Here were specimens of scientific apparatus, chests, boxes, oil paintings, arc lights, drawings, and an up-to-date bee-culture equipment, including the hive and the bees. Another room contained photographs of children at work and drawings of the new building now in course of construction on Central Park West.

In connection with the exhibition an alumni reunion was held on Friday evening and a public meeting at Carnegie Lyceum on Saturday evening. Addresses were given at the latter by Superintendent Thomas M. Balliet, of Springfield, Mass.; Prof. Mary S. Woolman, of Teachers College; Mr. Percival Chubb and Dr. Felix Adler, of he Ethical Culture Schools.—W. F. VROOM.

MODEL *VERSUS* PROJECT.

THE following is a brief extract from a paper on "The Drift of Manual Training" read before the Scholia Club of San Francisco by Walter J. Kenyon.

Elementary manual training in its experimental stages was receiving widespread attention in Europe as early as the seventies. Klauson Kaas, Dr. Götze, and others in Germany, Michelson in Denmark, Cygnæus in Finland, and Saloman in Sweden, were all working out divergent ideas. Today we find vestiges of them all struggling for a hearing in America. But the Swedish sloyd was destined to survive and dominate. It was plausible in its dogmas, captivating in its practicability, and altogether the most dazzling device that has ever been offered, intact, for educational discussion. Our lower-school manual training is the Swedish sloyd without any appreciable modification. It is intolerable to the Yankee spirit to be a self-confessed copyist; and hence a great many typesetters have been kept busy in committing to paper the differ-

ence between the Americanized scheme and its Swedish original. As a matter of application, there is no difference, nor can there be. For the sloyd scheme is like Prince Rupert's tear. It is beautiful in its integrity and self-consonance. And if the universe can be shaped about it as a jewel-case about a gem, the adjustment will be perfect. But the slightest modification of the jewel itself shatters the latter into fragments.

Our secondary manual-training courses were also modeled after a European conception. But in this case both the original and its American reproduction exhibited a considerable elasticity and the latter is today a long remove from its original form.

The difference between the two schemes, the Russian and the Swedish, is chiefly a difference of words. And it is a difference so trite, in these days, that I hardly dare venture a further reference. The Swedish idea stakes its all upon the model as something educationally differing from a mere exercise, or practice piece. The model is construed as being, in a sense, a capsuled exercise — that is to say, an exercise in the didactic conception of the teacher, but in the creative purpose of the pupil, not an exercise at all, but an undertaking of immediate utility. The Russian idea disregards this distinction and utilizes unapplied exercises, or practice pieces.

This line drawn between model and exercise is, in the main, a fanciful one. The theory is, of course, that the model will motivate the pupil to the same degree that one of his own projects might. The fallacy of this notion invalidates the chief claim made for a model series. It should be recalled that the model is devised by the teacher, not the pupil. It is prescribed, not suggested. It has its *raison d'être*, not in the circumstances attending the pupil's spontaneous interests, but in a logical and sequential scheme embodying the teacher's didactical idea.

In theory the sloyd presents a succession of projects which absorb the pupil's whole self in the highest economy of activity. In actual fact they are not projects at all. They are models in the same sense that the pothooks of his copy book are models. The aspect of initiative is just as absent as it is in his tables or his spelling list. The model series must seek its indorsement therefore on the ground of its formal character. It must be considered in the same category with the traditional rudiments. And elementary manual training, as at present practiced, must live or die upon this classification.

It is high time that this far-fetched characterization of the model as a spontaneous project should be abandoned. The models, impregnably intrenched behind their serial numbers, can never by any possibility be ingrafted upon the boy's interest so as to stimulate the children of his own creative fancy. It is more profitable all around that this be perceived and admitted. Then we can start out upon a solid basis of fact and estimate the model series for what it is worth. After we have thus called a spade a spade, it may yet turn out that spades are very useful in certain situations.

The *ne plus ultra* of manual training is something else, however. And it has yet to be found, in any form, available in the mechanism of a city school system. The sloyd, therefore, bids fair to hold its own indefinitely for the purposes of city schools, since a machine must ever have mechanical parts, the opprobrium of educational philosophy notwithstanding. But it is equally probable that the normal schools, and others somewhat freed from the exactions of mechanism, will at length abandon the idea of models and sequent exercises and revert to the natural adjustment of manual training as auxiliary to science and art.—*School Journal.*

EDITORIAL.

In another column we print a significant report recently adopted by the Western Drawing Teachers' Association. This provides for a change in the name of that association to "The Western Drawing and Manual Training Teachers' Association." This action is just what many members have desired for the past three years or more. They have considered it the only logical way to organize the forces intended to promote the interests of the manual arts in the West.

For ten years the Western Drawing Teachers' Association has done excellent work. Indeed it has been the strongest organization of drawing teachers in the country, exerting a wide influence, and bringing to its meetings the ablest speakers. Its annual reports have been an index of the progress of art instruction in the public schools of the United States; its annual exhibitions and its traveling exhibits have given the most practical kind of assistance and inspiration to teachers wherever these exhibits have been shown. During the past few years there has been a feeling on the part of a considerable number of the members of the association that a broader policy should be adopted, especially with reference to the Arts and Crafts movement and manual training. Many have believed that this would not only broaden but also strengthen the organization. When the matter was agitated two years ago there were several of the most influential members of the association who opposed the movement, and the matter was temporarily dropped. Conditions have changed so rapidly since that time that the association is practically unanimous in its support of the broader policy.

Meanwhile there has been a growing feeling that the manual-training teachers of the central states ought to form an organization. Once a movement was started with this end in view, but was not carried to consummation because a few felt that the manual-training teachers ought not to isolate themselves from other teachers. These few felt that the energies of the manual-training teachers should be devoted to helping the different state and sectional organizations of teachers already formed. The practical weakness of this position has been recognized by some, and lately we have heard more demands for an organization to bring together the teachers of manual training, or, as some would prefer, the teachers of all

the manual arts. Just at this opportune moment the Western Drawing Teachers' Association has come forward with its most happy solution of the whole difficulty. It is of course true that the problem will not really be solved until the next meeting of the association, when a new constitution will come up for adoption, but those who are acquainted with the newly elected officers feel confident that the success of the movement is insured and that the Milwaukee meeting next year will be an enthusiastic one and will mark the beginning of a new era for the association. But this result will be impossible without a hearty response from the manual-training teachers in the territory covered by the association. Concerning that, however, there ought to be no reasonable ground for doubt. Nothing worth having need be lost by such a fusion of interests and much is sure to be gained.

Early in the year Mr. Mason sent us the article on "Manual Training in Wisconsin," which we publish in this issue. Since that time a series of significant events has taken place in that state. In April Dr. L. D. Harvey, until recently state superintendent of public instruction, was elected superintendent of public schools in Menomonie. This fact alone is worthy of mention, for Mr. Harvey has a national reputation and one would expect him to prefer work in a larger city. But it is when one becomes acquainted with the plans that have been announced for the future of Menomonie's schools that one appreciates what Mr. Harvey's election means for Wisconsin, and indeed for other states as well. "He will superintend the immediate establishment of two normal branches of the city school system — one for preparing teachers for manual-training work, and the other for fitting teachers for domestic science. The kindergarten teachers' training school will also be maintained and enlarged as the demand seems to require. These normal schools will have two-year courses of study and will require standings equal to those of high-school graduates for admission."

In this connection one should remember that Menomonie already has a county school of agriculture and a county training school for teachers, both of which Mr. Harvey was instrumental in establishing, and that Senator J. H. Stout, Menomonie's benefactor, is president of both the city and the county school boards. When the proposed plans come to be in full operation there will be in this city of only about six thousand people, a progressive system of public schools from kindergarten through the high school; the Stout Manual Training School with its excellent equipment; the school of physical training with its

unsurpassed natatorium given by Mr. Stout ; the kindergarten training class for teachers ; the normal courses in manual training and domestic science ; the county school of agriculture, and the county training school for teachers. To these should be added the fine public library. Surely with Senator Stout as the moving spirit, and Mr. Harvey as the educational expert, Menomonie will soon become a famous educational center, if indeed it is not such already.

The new normal work in manual training will be under Mr. John H. Mason, director of the Stout Manual Training School. Mr. Mason graduated at the Worcester Polytechnic Institute in 1882 from the mechanical engineering course. After several years of practical experience, principally as draftsman, in eastern manufacturing establishments, he went to Wisconsin and started manual training in the Hillside Home School. From there he was called to the Stout Manual Training School at Menomonie in 1891. In 1893 he accepted a position as associate professor of manual training, Teachers College, New York city, where he remained until 1898, when he returned to Menomonie. Mr. Mason's broad experience, his knowledge of educational methods, and his familiarity with local conditions will make him an important factor in this unique scheme of educational work.

REVIEWS.

FOREIGN REVIEWS.

J. H. TRYBOM.

Manual Training in its Sociological and Physiological-Pedagogical Meaning, by H. Scherer, is the title of a small work lately published in Berlin by this well-known German advocate of manual training.

The object of the book, the author says, is "to help to form a right understanding of the true value of manual training."

In the first part of the work, which is devoted to the sociological aspect, the author shows the influence of technical work upon the development of the human race, shows that the higher mental and moral powers of man have chiefly been derived, aside from language, through activity and expression by means of the hands. He devotes a great deal of attention to the significance of tools, their meaning in the development of the race, how these auxiliaries to human effort gave increased importance to the value of the hands in the struggle for existence. After man had once become accustomed to the use of tools his further development did not take the form of new organs, but in the increased usefulness of his tools and the greater adaptability of the hand. He shows further how trades first appeared, and how they were gradually supplanted by the large factories and industrial enterprises of today; and how such conditions now exist, as to make it necessary to train children in the use of tools, in order to make successful competition possible with other nations in the industrial struggle now going on.

In the second part of the book which deals with the pedagogical aspect Herr Scherer begins with the presupposition that it is our duty "to place all allowed means within the reach of man to carry on the struggle for existence successfully, and also to help him to the enjoyment of as many as possible of the legitimate pleasures of life."

For this reason we must train not only the mental and moral powers of man but also develop his "technical" propensities. He refers to the theories of Comenius, Pestalozzi, and Froebel and deplores the lack of appreciation in the schools of their principles of education as far as expression (*Darstellung*) is concerned.

The first part of the work is by far the more interesting. It helps us to broaden our view of the significance of our subject, the meaning of the hand in the development of the human race. If the author had gone into more detail in his exposition this work would have added value, but even as it is it is an interesting exception to the typical books dealing with manual training.

H. Scherer, *Der Werkunterricht in seiner sociologischen und physiol.-päd. Begründung*. Berlin, Reuther & Reinhard, 1902. 1 M.

Our oldest publication devoted exclusively to manual training has ceased to exist. The *Slöjdundervisningsblad fran Nääs*, we regret to say, is no more. The editor, Herr Otto Salomon, gives three reasons for discontinuing the magazine: (1) The original aim of the paper, that is, to help to introduce manual training in the

public schools of Sweden, has to a great extent been accomplished. "When a certain amount of experience has been established," Herr Salomon says, "words become superfluous." Most of the teachers of the public schools of Sweden are now familiar with sloyd, a knowledge gained as students at Nääs and in many cases as teachers of the subject. (2) A certain discontent on the part of the editor with the general contents of the magazine and (3) the increased demand upon the editor's time in other fields of activity.

The first number of this publication appeared in March, 1885, and it has been issued regularly since that date with ten to twelve numbers each year. Herr Salomon's decision to discontinue the magazine will be felt by many Swedish teachers as a great loss to the cause of manual training.

BOOKS.

The Place of Industries in Elementary Education. By Katharine Elizabeth Dopp. The University of Chicago Press, Chicago, 1902, 5 × 7¾ in. pp. 208, price $1.10 prepaid.—This book fills a long-felt need, for although something has been said and done along these lines, no one up to the present time has put the matter into a form in which the practical is so closely allied to the theoretical. The title is perhaps a little misleading, for because of its point of view and broad sociological scope it is as valuable for those interested in higher education and for students of sociology as it is for teachers of elementary schools.

Chapter i is introductory and while reviewing the evolution of industries brings forward certain fundamental problems which are dealt with in chapter ii in reference to the significance of industrial epochs in relation to the natural and social environments of the people. The thought is developed further in chapter iii under the title "Origins of Attitudes that Underlie Industry." Chapter iv takes up practical applications and guiding principles—a chapter full of practical help and suggestions. The last chapter summarizes and reviews the entire situation.

The Place of Industries in Elementary Education offers much toward solving the problem of hand-work in the grades and will also determine a new basis or outlook for the hand-work in higher grades. Instead of numerous and narrow lines of often unrelated and specialized work, we have here an appeal for the recognition of the physical and psychical characteristics of the child, with its instincts and tendencies interpreted through the experiences of the race.

The book ought to do much in the way of straightening out misconceptions regarding the possible applications of this theory, and it ought also to bring out more forcibly than ever the injustice done to children in depriving them of vital experiences and their correlative emotional experiences.

One should read the book with three points in mind: to get the point of view; for the practical psychological insight into child nature which it affords; and lastly for the method of procedure regarding the application.

ETHICAL CULTURE SCHOOLS,
NEW YORK CITY. M. M. PERRIN.

With The Trees. By Maud Going. The Baker and Taylor Co., 33–37 East 17th street, New York; published April, 1903. 5 × 7 ⅜ in.; pp. x + 335; price $1, *net.*— An exceedingly entertaining and readable account in untechnical language of the story of the trees. The headings of a few of the chapters will give

an idea of the way in which the reader is carried along through the consideration of matters not usually noticed because not thought interesting: A Few Preliminaries; When the Sap Stirs; The Life of the Leaves; In the Water-Side Woods; In the High Woods; Late Blooming Trees; Trees of Streets, Parks, and Gardens; The Mellowing Year; etc. This book should be in every school library; but it is of special interest to teachers of nature study and manual training for the information it contains and the attractive way in which it is presented. There are about forty illustrations, of which fourteen are full-page photographic reproductions. The book is a companion volume to *With The Wild Flowers*, and *Field, Forest and Wayside Flowers*, by the same author.

WILLIAM T. BAWDEN.

TEACHERS COLLEGE,
New York, N. Y.

More Baskets and How to Make Them. By Mary White. Doubleday, Page & Co., New York, N. Y., 1903. 7½ × 5 in.; pp. 157 + 10 pages of half-tones; price, $1, *net.*— Basket-makers and teachers who are acquainted with Miss White's *How to Make Baskets* will be glad to welcome this companion volume. The second book supplies the deficiencies of the first so that the two taken together make a comprehensive treatise on basket-making. A chapter is given to raffia basketry, one to palm-leaf basketry and one to raffia and palm-leaf hats. "How to Rush-Seat Chairs" is the title of a welcome chapter which tells how to make rush-bottoms out of the ordinary cat-tails that grow in the marshes. It tells when to gather the cat-tails, how to cure them and how to use them. The last chapter contains valuable suggestions on the preparation and use of natural dyes and calls attention to some unusual materials suitable for basketry. The baskets shown in the illustrations throughout the book are, most of them, larger and more artistic than those in the previous volume.—C. A. B.

Engineering Education. Proceedings of the tenth annual meeting of the Society for the Promotion of Engineering Education, held in Pittsburg, Pa., June 1902. Edited by Robert Fletcher, Calvin M. Woodward and Clarence A. Waldo. Published by Engineering News Publishing Co., 220 Broadway, New York. 9 × 6 in.; pp. 300; price, $2.50.— The only part of this volume that is of especial interest to manual-training teachers is the brief discussion of the report of the standing committee on entrance requirements. This committee is attempting to formulate acceptable definitions of the several subjects required for admission to engineering colleges. In discussing this report Dr. C. M. Woodward expressed the opinion that "educational shopwork is something that belongs to the preparatory school;" secondary schools should be encouraged to relieve the engineering college of this work. To this end shopwork should be recognized as an entrance subject and accurately defined. It should be possible for schools to know just what is wanted in this subject as well as in others. A motion made by Dr. Woodward to give recognition to manual training was adopted. The committee are now at work on a definition of shopwork. Their next report will be awaited with interest.—C. A. B.

Wall Papers and Wall Coverings. By Arthur Seymour Jennings. William T. Comstock, New York, 1903. 10½ × 7 in.; pp. 161; price, $2.00.— A practical handbook for decorators, paper-hangers and house-owners, containing a great variety of suggestions concerning the conventional methods of covering wall surfaces.

English, French, and American wall papers and a variety of other wall-coverings are discussed and elaborately illustrated with half-tone engravings, including several in colors. One chapter is devoted to "the tools employed in paper-hanging" and another to the process of hanging papers on walls. Stenciling is briefly treated in an appendix.

How to Make Money. Edited by Katherine Newbold Birdsall. Doubleday, Page & Co., New York, 1903. 7½ in.; pp. 249; price, $1, *net.*—This book describes eighty novel and practical suggestions for untrained women who wish to earn money. The suggestions contained in the book are based, for the most part, on practical experience.

Natural Woods and How to Finish Them. 6½ × 4½ in.; pp. 77.—This book is an advertisement of the finishing materials, manufactured by Berry Bros. of Detroit, Mich., and is for free distribution. After setting forth their various finishing materials the book explains in detail how to make twenty different oak finishes, and one each, for seventeen other varieties of wood. These explanations are given in the form of specifications. Next follows specifications for floor and outside finishing. The closing chapter entitled "General Notes" gives the reasons for the various steps in finishing wood. This little book, although primarily intended for architects and wood-finishers, will be a valuable assistant to teachers of manual training. The general notes in the last chapter, which give the principles of finishing, place the teacher in a position to originate finishes for himself.

C. S. VAN DEUSEN.

BRADLEY POLYTECHNIC INSTITUTE.

Home Building and Furnishing. Being a combined new edition of "Model New Houses for Little Money" by William L. Price, and "Inside of 100 Homes" by W. M. Johnson. Doubleday, Page & Co., New York. 7½ × 5 in.; pp. 140; price, $1, *net.*—This book is made up of articles that have been published in the Ladies Home Journal. These were written to be of aid in the building of small homes. That they have been found valuable is proved by the fact that 500 houses were built in one year from the plans given. Part I, by Mr. Price, discusses houses ranging in price from $1000 to $4000 to suit lots of different shapes. Part II, by Mr. Johnson, discusses the different parts of the house, a chapter being given to a subject, as the hall, the living-room, cosy corner, library, kitchen, sleeping room, bath room, piazza, etc.

The book is written in non-technical language, is full of suggestions and is amply illustrated with half-tones and line cuts.

The following have been received:

Address on Education for the Improvement of Agriculture. By James W. Robertson, Commissioner of Agriculture and Dairying for the Dominion of Canada. 6½ × 9½ in.; pp. 47; paper cover.

Woodwork for the Grammar Grades: Outlines of Manual Training, San Francisco Public Schools. Prepared by C. T. Work. 6 × 9 in.; pp. 87; paper covers.—The chapter headings in this book are: (1) "Tools and Processes;" (2) "Work for Seventh and Eighth Grades;" (3) "Helps for Pupils;" (4) "Mechanical Drawing;" (5) "Geometric Constructions;" (6) "A Word to Teachers." Copies of this Outline can be obtained by addressing the Board of Education, San Francisco, Calif.